CONTENTS

	Page	
. **Guidelines for Preparation of Proposals**	1	1/A12
Types of Research Supported	1	
The Proposal	2	
Who May Submit	3	1/A13
When to Submit	5	1/A14
Where to Submit	5	1/B2
What to Submit	6	1/B3
Cover Page	7	1/B4
Table of Contents	8	
Project Summary	8	1/B5
Project Description	9	
Bibliography	9	1/B6
Biographical Sketches	10	
Budget	10	1/B7
Salaries and Wages	11	1/B8
Research Assistantships	13	
Fringe Benefits	13	1/B10
Equipment	13	
Materials and Supplies	14	
Domestic Travel	14	1/B11
Foreign Travel	15	1/B12
Publication Costs/Page Charges	16	
Computer (ADPE) Services	16	1/B13
Consultant Services	16	
Participant Support Costs	16	
Other Direct Costs	17	
Indirect Costs	17	1/B14
Current and Pending Support	18	
Appendixes	19	1/C1
Facilities	19	1/C2
Special Considerations	20	1/C3
. **Proposal Processing and Evaluation**	22	1/C5
I. **Declinations and Withdrawals**	26	1/C9

IV. Grants for Other Purposes Connected with Research 27

1/C10

Specialized Facilities 27
Foreign Travel 27
Conferences, Symposia, and Research Workshops 28
Doctoral Dissertation Research..... 29 1/C11
Engineering Research Initiation 30 1/C12
Small-College Faculty Opportunity Awards 30 1/C13
Information Science 30
Other Research Support Activities . 30

V. The Award and Continued Grant Support 31

1/C14

Grant Award 31
Requests for Renewal of Support... 32 1/D1
No-Cost Extensions 33 1/D2

VI. Grant Administration Highlights ... 35

1/D4

Institutions Applying for the First Time 35
Adherence to Original Research Objectives 36
Adherence to Original Budget Estimates........................ 36 1/D5
Changes in Personnel 38
Transfer of Principal Investigator .. 38 1/D7
Equipment........................ 39
Subcontracts...................... 39 1/D8
Excess Government Property 39
Termination of Grants 40
Grant Reports 40 1/D9
Acknowledgment of Support and Disclaimer 41 1/D10
Proposal as Public Record 42
Inventions, Software, and Copyrights 42 1/D11

II. Appendixes 44 1/D13

I. Cover Page Format 44

II. Project Summary 46 1/E1

III. Summary Proposal Budget Format 48 1/E3

IV. Current and Pending Support . . 54 1/E9

V. Check List for Proposal Submission 56 1/E11

VI. Final Project Report 58 1/E13

VII. Programs Providing Scientific Research Support 62 1/F3

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GRANTS FOR SCIENTIFIC RESEARCH

COMPLETED

NATIONAL SCIENCE FOUNDATION

NSF 78-41 A

FOREWORD

The National Science Foundation Act of 1950, as amended, authorizes the Foundation to initiate and support scientific research and programs to strengthen scientific research potential.

The Foundation carries out its statutory responsibilities for the support of research, including applied research, through a number of programs. Fundamental research in all scientific disciplines is supported in several NSF directorates. The Foundation's *Guide to Programs* and other brochures or announcements contain information about other programs (see NSF *List of Publications*). These brochures are available from: Publications, National Science Foundation, Washington, D.C. 20550.

Although many provisions of this brochure apply to all research programs, *the guidelines and instructions on the following pages are directed specifically to the interests of investigators applying for support of projects in fundamental or basic research and other closely related activities,* such as foreign travel, conferences, symposia, and research equipment and facilities. Sources of additional information on these related activities are noted in the text. Through such support, the Foundation assists individual scientists or groups of scientists who seek answers to questions concerning fundamental scientific processes and forces, natural laws, and phenomena in any recognized scientific discipline.

Business officers and administrators should refer also to the more comprehensive information in the *NSF Grant Policy Manual,* which is available only by subscription, $12 domestic and $15 foreign, from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. This looseleaf manual, identified by GPO as

NSF 77-47, will be updated periodically through supplements, which will be furnished automatically to subscribers.

CONTENTS

Page

I. **Guidelines for Preparation of Proposals** 1

Types of Research Supported 1
The Proposal 2
Who May Submit 3
When to Submit 5
Where to Submit 5
What to Submit 6
  Cover Page 7
  Table of Contents 8
  Project Summary 8
  Project Description 9
  Bibliography 9
  Biographical Sketches 10
  Budget 10
    Salaries and Wages 11
    Research Assistantships 13
    Fringe Benefits 13
    Equipment 13
    Materials and Supplies 14
    Domestic Travel 14
    Foreign Travel 15
    Publication Costs/Page Charges 16
    Computer (ADPE) Services 16
    Consultant Services 16
    Participant Support Costs...... 16
    Other Direct Costs 17
    Indirect Costs 17
  Current and Pending Support 18
  Appendixes 19
    Facilities 19
    Special Considerations 20

II. **Proposal Processing and Evaluation** 22

III. **Declinations and Withdrawals** 26

IV. **Grants for Other Purposes Connected with Research** 27

Specialized Facilities 27
Foreign Travel 27
Conferences, Symposia, and Research Workshops 28
Doctoral Dissertation Research..... 29
Engineering Research Initiation 30
Small-College Faculty Opportunity Awards 30
Information Science 30
Other Research Support Activities . 30

V. **The Award and Continued Grant Support** 31

Grant Award 31
Requests for Renewal of Support... 32
No-Cost Extensions 33

VI. **Grant Administration Highlights** ... 35

Institutions Applying for the First Time 35
Adherence to Original Research Objectives 36
Adherence to Original Budget Estimates 36
Changes in Personnel 38
Transfer of Principal Investigator .. 38
Equipment 39
Subcontracts 39
Excess Government Property 39
Termination of Grants 40
Grant Reports 40
Acknowledgment of Support and Disclaimer 41
Proposal as Public Record 42
Inventions, Software, and Copyrights 42

VII. Appendixes 44

- I. Cover Page Format 44
- II. Project Summary 46
- III. Summary Proposal Budget Format 48
- IV. Current and Pending Support .. 54
- V. Check List for Proposal Submission 56
- VI. Final Project Report 58
- VII. Programs Providing Scientific Research Support 62

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I. GUIDELINES FOR PREPARATION OF PROPOSALS

TYPES OF RESEARCH SUPPORTED

The Foundation considers proposals for support of research in any field of science, including but not necessarily limited to: astronomy, atmospheric sciences, biological and behavioral sciences, chemistry, computer sciences, earth sciences, engineering, information science, mathematical sciences, materials, oceanography, physics, and social sciences. Interdisciplinary proposals also are eligible for consideration. (For a list of program areas, see Appendix VII.)

NSF normally will not support clinical research (diagnosis or treatment of disease, abnormality, or malfunction in people or animals or testing of drugs or procedures for their treatment) or research requiring security classification.

Proposals may be submitted by individuals or groups for support of research or research equipment.

Group Research Proposals

The term "group research proposal" describes a research project combining into one administrative mechanism several projects that ordinarily could be funded separately. A single scientist bears primary responsibility for the administration of the grant and discussions with the Foundation. These grants support the research of groups of scientists who *themselves* judge that the effectiveness of their research would be enhanced by group funding. They may prefer to be supported as a group because their research is inherently a group activity, or there may be valuable flexibility in the allocation of funds through the administration of a single account. Greater flexibility in using funds to support technicians or to buy equipment is one such advantage; the ability to follow up breakthroughs or to deal with unforeseen problems is another.

The institution must assure NSF that the proposed activity is administratively manageable. NSF may request a revised proposal if it believes that the project is so complex that it will be too difficult to review or administer.

Research Equipment Proposals

Proposals for specialized research equipment may be submitted by an institution for individual investigators or groups of investigators within the same department, from several departments, a school, an institution, or a region. Investigators may be working in related areas, or their research may be truly multidisciplinary. Equipment proposals (20 copies are required) should follow the format of research proposals; special considerations are noted at appropriate places in the text of this brochure.

THE PROPOSAL

The proposal should present the (1) objectives and scientific significance of the proposed work; (2) suitability of the methods to be employed; (3) qualifications of the investigator and the grantee institution; and (4) amount of funding required. Since the proposal will compete with others on related topics, using the procedures and criteria described in Section II of this brochure, it should present the scientific merit of the proposed project clearly and convincingly and should be prepared with the care and thoroughness of a paper submitted for publication. The proposal should be reviewed carefully to ensure that all essential data are included or summarized, unless they are readily available in published literature. Omissions frequently generate additional correspondence and delay processing. A checklist is included (see Appendix V).

WHO MAY SUBMIT

Scientists usually initiate research proposals, which are submitted by their employing organizations. Before formal submission the proposal may be discussed with NSF staff, either by letter, telephone or in person. Graduate students are not encouraged to submit research proposals (except for Doctoral Dissertation Research Grants, discussed in Section IV). Normally they should apply for fellowship support or arrange to serve as research assistants to faculty members.

The following limitations refer specifically to submission of proposals for scientific research support. Eligibility of institutions and investigators may vary in other NSF programs (see *Guide to Programs*).

Categories of Applicants

(1) *Universities and colleges:* U.S. universities and colleges, acting on behalf of their faculty members, submit most research proposals. See also No. 3 below.

(2) *Nonprofit, nonacademic research institutions:* NSF accepts proposals from independent museums, observatories, research laboratories, professional societies, and other similar organizations that are directly associated with educational or research activities of academic institutions. Other types of nonprofit, nonacademic institutions normally will receive NSF basic research grants only when the proposed research is judged to be of special significance or the institution has special capabilities.

(3) *Private profit organizations:* The Foundation welcomes unsolicited research proposals from commercial firms, but it also wants to avoid substituting Federal support for normal commercial investment in research or compromising the vitality of research in educational institutions, where research makes a special added contribution to science education. Thus, an unsolicited research proposal from a commercial firm may be funded when (a) the project is of special concern from a national point of view; (b) special resources are available in industry for the work; or (c) the proposed project is especially meritorious. NSF is interested in supporting research projects that couple industrial research resources and perspectives with those of universities. Therefore, it especially welcomes proposals for cooperative research projects involving both universities and industry.

(4) *Foreign institutions:* Although NSF rarely provides U.S. dollar support for research by foreign institutions, they may obtain financial support through U.S.-owned excess foreign currencies under the Special Foreign Currency Program. NSF also considers proposals for cooperative research projects involving U.S. and foreign institutions provided support is requested only for the U.S. portion of the collaborative effort. (For further information and program guidelines, contact the Division of International Programs.)

(5) *Other Federal agencies.* Scientists employed by other Federal agencies are not encouraged to submit unsolicited research proposals to NSF. In special circumstances, however, Federal scientists may receive research support if they can demonstrate that it will serve more efficiently than other means the research needs of scientists from academic or academically related institutions. Preliminary inquiry must be made to the appropriate

program (see Appendix VII) before a formal proposal may be considered.

(6) *Unaffiliated scientists in the United States:* Scientists in the United States who have no affiliations with organizations that could act as grantee institutions may receive support for meritorious research if they have the capability and facilities needed to perform the work, agree to fiscal arrangements satisfactory to the NSF Grants Officer, and otherwise meet the conditions described in this brochure. Unaffiliated scientists should contact the appropriate program (see Appendix VII) before submitting a proposal.

WHEN TO SUBMIT

Research proposals may be submitted at any time. Applicants should allow 6 to 9 months for review and processing. Proposals to be funded in a particular fiscal year (ending September 30) normally should be received no later than January of that year. Some programs set target dates for submission of proposals to allow time for their consideration by advisory committees, which meet periodically. These target dates are published in the *NSF Bulletin*. Inquiry about submission also may be made to the appropriate program office.

Every effort is made to reach a decision and inform the applicant promptly. Until a decision is announced, no information can be provided on the probability of support.

WHERE TO SUBMIT

Proposals should be addressed to the Central Processing Section, National Science Foundation, Washington, D.C. 20550. If copies of the proposal are mailed in more than one package, the number of packages should be marked on the outside of each package. Proposals must be sent prepaid, not collect.

The acknowledgment of receipt of the proposal will contain a registry number. Later communications about the proposal should be addressed to the cognizant program officer and identified by the NSF registry number.

WHAT TO SUBMIT

Proposals should cover the points discussed in the following paragraphs insofar as they are applicable. To facilitate processing, proposals should be stapled in the upper left-hand corner, but otherwise unbound, single-spaced, with pages numbered at the bottom and a one-inch margin at the top. The original signed copy should be printed only on one side of each sheet. Additional copies may be printed on both sides. Appendix VII indicates the required number of copies of proposals, including the original signed copy. Any reprints, appendixes, or other materials to be considered with the proposal must be attached to the individual copies of the proposal. To avoid delay in the review process, the proposal should be complete at the time of submission.*

Since thousands of proposals are received each year, their review is facilitated when the contents are assembled in the following standard sequence: cover page, table of contents, project summary, project description, bibliography, biographical sketches, budget, current and pending support, appendixes. Material on facilities and special considerations affecting the research should be included in appendixes.

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* Institutions applying for the first time, or which have not received an NSF award within the preceding 2 years, commercial organizations, and nonprofit, nonacademic institutions should refer to the *NSF Grant Policy Manual* for instructions on specific information required.

Cover Page

The desired format for the cover page is given in Appendix I.

If there have been prior discussions with a particular NSF program and the proposal is intended for its consideration, complete the box "For Consideration by NSF Organizational Unit."

The title of the proposed research project should be brief, scientifically valid, intelligible to a scientifically literate reader, and suitable for use in the public press. NSF may edit the title of a project before making an award.

The proposed duration for which support is requested should be consistent with the nature and complexity of the proposed research. Research grants may be awarded for periods up to 5 years.

Specification of a desired starting date for the research is important and helpful to NSF staff. However, the institution may not make charges to a grant for costs associated with the project that were incurred before the effective date designated in the grant letter. Should unusual situations, such as long lead time on procurements, create problems regarding the proposed effective date, the investigator should consult the institution's business office for advice and inform the NSF program office to which the proposal has been assigned.

Small businesses should check the small-business box on the cover page. A small business must be organized for profit, independently owned and operated (not a subsidiary of or controlled by a large firm), have no more than 500 employees, and not be dominant in its field (from Title 13, Code of Federal Regulations, Part 121 as amended). The box should be checked also when the proposal involves a cooperative effort between an academic institution and a small business.

Research proposals should be cleared through the institutional officer having responsibility for Federal business relations to ensure conformance with local and Federal administrative procedures. One copy of the proposal must be signed by the principal investigator(s) and an official authorized to commit the institution in business and financial affairs. Proposing institutions may have additional signature requirements. Other copies should record the names and titles of those who have signed the original. Proposals are incomplete if endorsement signatures are omitted.

Table of Contents

The table of contents, which is required, should show the location of each section of the proposal as well as major subdivisions of the project description, such as the summary of previous work, statement of proposed research, and methods and procedures to be used. The major sections are: Table of Contents, Project Summary, Project Description, Bibliography, Biographical Sketches, Budget, Current and Pending Support, and Appendixes.

Project Summary

A 200-word summary of the proposed research, suitable for publication and using the format of Appendix II, is required. If a grant is awarded, the summary, edited if necessary, will be sent to the Smithsonian Science Information Exchange and made available to the public. The summary should include a statement of the research objectives, scientific methods to be employed, and the significance of the proposed research to the advancement of scientific knowledge. It should be informative to other scientists in the same or related fields and, insofar as possible, understandable by a scientifically literate reader.

Project Description

The main body of the proposal should be a detailed statement of the work to be undertaken and should include: objectives and expected significance; relation to the present state of knowledge in the field, to previous work done on this project, and to related work in progress elsewhere. The statement should outline the general plan of work, including the broad design of experiments to be undertaken and an adequate description of experimental methods and procedures. Any substantial collaboration with individuals not referred to in the budget should be described and documented with a letter from each collaborator.

Proposals for equipment normally compete with proposals for regular research projects. Therefore, each potential major user should describe the research project(s) for which the equipment will be used. The descriptions should be succinct, not necessarily as detailed as in a regular research grant application, and should emphasize the intrinsic scientific merit of the research and the importance of the equipment to it. A briefer summary will suffice for auxiliary users.

Brevity will facilitate effective review. The project description normally should not exceed 15 single-spaced pages. Somewhat greater length may be appropriate for multiple-investigator proposals. Reviewers will be made aware of this norm.

Bibliography

A bibliography of pertinent literature is required.

Biographical Sketches

A short biographical sketch of each senior scientist should be included and a list of each investigator's publications during the past 5 years including those in press. Equipment proposals should include a brief biographical sketch and a list of publications for each user.

For the personnel categories listed below (see Appendix III for definitions), the proposal should include information on exceptional qualifications of these individuals that merit consideration in the evaluation of the proposal.

- Postdoctoral associates
- Other professionals
- Graduate students (research assistants)*
- Secretarial . clerical
- Technical . shop . other

Budget

Unless a particular program brochure provides otherwise, each proposal must contain a budget for each year of support requested and a cumulative budget for the full term of requested NSF support. (The prescribed budget format may be reproduced from Appendix III or Exhibit II-4, *NSF Grant Policy Manual*.) Contributions to the proposed research from other Federal and non-Federal sources (other than from the submitting institution itself) should be shown under "Remarks." The proposal may request funds under any of the categories listed so long as the item is considered necessary to perform the research. Normally equipment grants do not provide support for personnel, overhead, installation, or operating costs. If funds for such costs are considered essential to the success of the research to be performed with the requested equipment, the proposal should provide detailed justification. The Foundation requires cost sharing in accordance with policies set forth in the *NSF Grant Policy Manual*.

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* Note: Research associates and research assistants are not to be designated as "NSF Fellows" or other title of similar import. This designation is reserved for holders of Foundation fellowship awards.

SALARIES AND WAGES

As a general policy NSF recognizes that salaries of faculty members and other personnel associated directly with the research constitute appropriate direct costs in proportion to the effort devoted to the research.

The names of the principal investigator(s), faculty, and other senior associates and the estimated number of academic-year, summer, or calendar-year man-months for which NSF funding is requested should be listed. For postdoctoral associates and other professionals, list each position with the number of full-time-equivalent man-months and rate of pay (hourly, monthly, or annual) indicated. For graduate and undergraduate students, secretarial, clerical, technical, etc., only the total number of persons and total amount of salaries per year in each category are required. Salaries requested must be consistent with the institution's regular practices.

The submitting institution may request that salary data on senior personnel not be released to persons outside the Government. In this case, the item for senior personnel salaries in the formal proposal may appear as a single figure and the man-months represented by that amount omitted. If this option is exercised, however, senior personnel salaries and man-months must be itemized in a separate statement, two copies of which should accompany the proposal (see "Proposal as Public Record"). This statement must include all of the information requested in the Summary Proposal Budget for each person involved. NSF will not forward the detailed information to reviewers and will hold it privileged to the extent permitted by law. The information on senior personnel salaries will be used as the basis for determining the salary amounts shown in the grant budget.

NSF regards research as one of the normal functions of faculty members at institutions of higher education. Compensation for time normally spent on research within the term of appointment is deemed to be included within the faculty member's regular institutional salary. Grant funds may not be used to augment the total salary or rate of salary of faculty members during the period covered by the term of faculty appointment or to reimburse faculty members for consulting or other time in addition to a regular full-time institutional salary covering the same general period of employment.

Summer salary for faculty members on academic-year appointments will not be funded for more than two-ninths of their regular academic-year salary. This total includes summer salary received from all NSF-funded grants. Exceptions to this limitation are permitted only in unusual cases, which must be fully justified in the proposal.

These same principles apply to other types of organizations, such as research institutes. Since their employment periods are usually annual, however, there is seldom a possibility of "summer salary" in an NSF grant.

A special question sometimes arises when an independent institute or laboratory proposes to employ college or university faculty members on a part-time basis. In such cases the general intent of the policies above shall apply, so that an individual's total income will not be augmented in ways that would not be possible under a grant to an academic institution.

RESEARCH ASSISTANTSHIPS

The budget may request funds for support of graduate students (research assistants) to help carry out the proposed research. Compensation classified as salary payments should be requested in the salaries and wages category. Any funds requested for tuition remission should be listed separately under "All Other Direct Costs."

FRINGE BENEFITS

If the grantee's usual accounting practices provide that its contributions to employee "benefits" (social security, retirement, etc.) be treated as direct costs, NSF grant funds may be requested to defray such expenses as a direct cost.

EQUIPMENT

NSF defines equipment as an item of property that has an acquisition cost of $300 or more and an expected service life of 1 or more years. Items of needed equipment should be individually listed by description and estimated cost, including tax, and adequately justified. Allowable items ordinarily will be limited to scientific equipment and apparatus that are not already available for the conduct of the work. General-purpose office equipment normally will not be considered eligible for support.

The purchase of each item of equipment costing $1,000 or more requires prior written approval by NSF. This approval may be indicated on the grant budget or in subsequent correspondence. If a proposal includes the purchase or lease of special-purpose equipment having a unit acquisition cost above $10,000, the authorized organizational representative must certify that the equipment (a) is essential and not reasonably available and accessible to the project and (b) if funded by NSF, will be subject to reasonable inventory controls, maintenance procedures, and organizational policies that will enhance its multiple or shared use on other projects, if the other use will not interfere with the work on the project for which the equipment is being acquired. Because of the lead time involved, it may not be practical for an institution to make this certification when it submits the proposal. In such cases, NSF will accept a statement to that effect in the proposal with the understanding that the certification will be supplied before a grant is made.

MATERIALS AND SUPPLIES

The budget should indicate in general terms the types of required expendable materials and supplies with their estimated costs. The breakdown should be more detailed when the cost is substantial.

DOMESTIC TRAVEL

The type and extent of travel and its relation to the research should be briefly specified. Funds may be requested for field work, attendance at meetings and conferences, other travel associated with the research, and subsistence. In order to qualify for support, however, attendance at meetings or conferences must enhance the investigator's capability to perform the research, plan extensions of it, or disseminate its results. Consultants' travel costs also may be requested.

FOREIGN TRAVEL

Travel in the United States and its possessions, Puerto Rico, and Canada is considered domestic travel; all other is foreign. The proposal should include relevant information (including countries to be visited) and justification for any foreign travel planned in connection with the research. Each foreign trip not specifically included and authorized in the grant budget must receive advance written approval by the Foundation if grant funds are to be used.

Allowances for air travel normally will not exceed the cost of round-trip, jet-economy air accommodations. Persons traveling under NSF grants or contracts must travel by U.S. flag carriers, if available, unless:

1. The traveler, while enroute, has to wait 6 hours or more for an available U.S carrier.
2. The flight by a U.S. flag carrier takes 12 or more hours longer than a foreign carrier.

Travel support for dependents may be requested under the following conditions:

1. The investigator is a key person who is essential to the research on a full-time basis.
2. The investigator's residence away from home and in a foreign country for a continuous period of 6 months or more is essential to the effective performance of the project.
3. The payment of dependent's travel allowance is consistent with the policies of the institution administering the grant.

The Foundation also provides limited support for foreign travel to international scientific meetings through competitively granted funds that are budgeted separately. (See Section IV for additional information.)

PUBLICATION COSTS/PAGE CHARGES

The budget may request funds for the costs of preparing and publishing the results of research conducted under the grant, including costs of reports, reprints, page charges or other journal costs (except costs for prior or early publication), and necessary illustrations.

COMPUTER (ADPE) SERVICES

The cost of computer services, including computer-based retrieval of scientific and technical information, may be requested. A justification based on the established computer-service rates at the proposing institution should be included. The budget also may request costs, which must be shown to be reasonable, for leasing automatic data-processing equipment (ADPE). The purchase of computers or associated hardware should be requested as items of equipment.

CONSULTANT SERVICES

Anticipated consultant services should be justified and information furnished on each individual's expertise, primary organizational affiliation, daily compensation rate, and number of days of expected service. Consultants' travel costs should be listed separately under travel in the budget. Payment for a consultant's services may not exceed the daily equivalent of the maximum rate paid a U.S. Government GS-18 ($183).

PARTICIPANT SUPPORT COSTS

Normally budgets do not include costs for participant support. The use of this category in proposals for support of conferences, symposia, or workshops is discussed in Section IV.

OTHER DIRECT COSTS

The budget should itemize other anticipated direct costs not included under the headings above. Examples are: aircraft rental, space rental at research establishments away from the grantee institution, minor building alterations, payments to human subjects, service charges, and construction of equipment or systems not available off-the-shelf. Reference books and periodicals may be charged to the grant only if they specifically relate to the research project.

Subcontracts should be disclosed in the proposal so that the grant instrument will contain their prior approval. There should be a completed budget, in the prescribed NSF format, for each subcontract with signatures of officials of the subcontracting organization. The total amount of each subcontract should appear as a line item under "All Other Direct Costs" of the master budget for the project. None of the research effort under an NSF grant may be contracted or transferred to another organization without prior written approval by NSF.

INDIRECT COSTS

The indirect cost rate negotiated by the institution with the cognizant Federal negotiating agency must be used in computing indirect costs for a research proposal. Determination of the appropriate indirect cost rate depends on a combination of factors including, but not limited to, physical location of the work. If your institution has no established indirect cost rate, it should either consult the Foundation, which will establish liasion with the cognizant Federal negotiating agency, or submit separately an indirect cost rate proposal to the NSF Division of Grants and Contracts, Attention: Indirect Costs, Washington, D.C. 20550. Rate-proposal data vary according to the type of proposing organization. An institution may obtain appropriate guidelines for submitting rate proposals from the Division of Grants and Contracts (telephone: (202) 632-7545).

It is NSF policy that grantees are entitled to full reimbursement from grant funds for indirect costs allocable to the NSF share of allowable direct costs of a project except for grants:

- to individuals;
- solely for the support of travel, equipment, construction of facilities, or doctoral dissertations;
- for participant support costs (see "Conferences, Symposia, and Research Workshops"); and
- foreign grantees.

Current and Pending Support

Appendix IV gives the format for reporting current and pending support for proposals, as well as for each subsequent funding request in the case of continuing grants. Besides the proposed project, all current research to which the principal investigator(s) and other senior personnel have committed a portion of their time must be listed, whether or not their salaries are included in the budgets of the various projects. The number of man-months or percentage of effort to be devoted to the projects should be stated regardless of source of support. Similar information must be provided too for all proposals that are being considered by or will be submitted soon to other possible sponsors, including NSF.

If the project now submitted has been funded previously by a source other than

NSF, the information requested in the paragraph above should be furnished for the immediately antecedent funding period. This information will help the Foundation analyze shifts in research support.

If the proposal is being submitted to other possible sponsors, all of them should be listed. Concurrent submission of a proposal to other organizations will not prejudice its review by the Foundation.

Appendixes

FACILITIES

An appendix to the proposal should describe available facilities and major items of equipment to be used in the research.

Proposals requesting multiple-use equipment should describe comparable equipment that is already at the proposing institution and explain why it cannot be used. The degree of utilization also should be discussed. Equipment to be purchased, modified, or constructed should be sufficiently described to allow comparison of its capabilities with the needs of the research. Whenever possible, the proposal should specify the manufacturer and model number.

In equipment proposals, usually only a single instrument or system will be considered. If more than one is requested, the proposal must arrange them in order of priority and give explanations and scientific justification for each. The institution's contribution to the cost of equipment or its willingness to support the cost of construction or renovation of needed facilities may be considered by NSF as an indication of the institution's commitment to the project.

Equipment proposals should also describe arrangements for maintenance and operation, including:

1. The name and biographical sketch of the person(s) who will have overall responsibility for maintenance and operation and a brief statement of his or her qualifications for this responsibility, if the sketch does not make them obvious.

2. A description of the physical facility where the equipment will be located. Floor plans or other data may be included if appropriate.

3. Annual budget for operation and maintenance of the proposed equipment, indicating source of funds.

4. A brief description of other research-support services available, particularly related equipment, and the annual budget for their operation, maintenance, and administration.

If any of the project is to be performed away from campus or headquarters, this should be explained fully. Collaborative arrangements should be documented.

SPECIAL CONSIDERATIONS

Several situations require that special information and supporting documents be included in the proposal, normally in an appendix, before funding can be approved. Among these are the following, some mandated by Federal law:

1. Research that has an actual or potential impact on the environment.

2. Research in foreign countries. Some governments require nonresidents to obtain official approval to do research within their borders. Investigators are responsible for obtaining the required authorizations and for advising NSF that they have been obtained or re-

quested. Advance coordination should minimize disruption of the research.

3. Research in the Antarctic.
4. Research at a registered historic or cultural property.
5. Research involving the use of recombinant DNA molecules generated *in vitro*.
6. Research involving the use of human subjects, hazardous materials, laboratory animals, marine mammals, or endangered species.

In addition, the proposal should alert NSF officials to unusual circumstances that require special treatment, including, for example, proprietary or other privileged information in the proposal, matters affecting individual privacy, or possible national security implications.

The proposal should address each special consideration that is relevant to the project and provide information on the status of any special permissions, clearances, or certifications. Assessment of environmental impact should be included where appropriate.

Specific guidance on the need for additional documentation may be obtained from the institution's research administration office or the *NSF Grant Policy Manual*.

II. PROPOSAL PROCESSING AND EVALUATION

Research proposals are received by the Central Processing Section, acknowledged, and assigned to the appropriate NSF program for evaluation. Those not clearly assignable are referred to appropriate program personnel and occasionally to a directorate office for determination. All proposals are reviewed carefully by a scientist serving as an NSF program officer and usually by 3 to 10 other scientists who are expert in the particular field represented by the proposal. Some program officers obtain further comment from assembled advisory committees before recommending final action on proposals. Recomendations for awards are further reviewed by senior NSF staff to assure that actions being taken are in accordance with established Foundation policy. When decisions are announced, verbatim copies of reviews, excluding the identity of the reviewer, are available to the principal investigator/project director.

The following criteria or factors are considered in the evaluation of research projects.*

Criteria relating to competent performance of research—the technical adequacy of the performer and of his or her institutional base:

1. The scientist's training, past performance record, and estimated potential for future accomplishment.
2. The scientist's demonstrated awareness of previous and alternative approaches to the problem.

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* Taken from the National Science Board policy statement, NSB-74-300, Criteria for the Selection of Research Projects by the National Science Foundation.

3. Probable adequacy of available or obtainable instrumentation and technical support.

Criteria relating to the internal structure of science itself:

4. Probability that the research will lead to important discoveries or valid, significant conceptual generalizations within its field of science or (in the most favorable cases) extending to other fields as well.
5. Probability that the research will lead to significant improvements or innovations of investigative method—again with possible extension to other fields of science.

For scientific research support, the emphasis is overwhelmingly on Criteria 1-5.

Criteria relating to utility or relevance:

6. Probability that the research can serve as the basis for new invention or improved technology.
7. Probable contribution of the research to technology assessment—i.e., to estimating and predicting the direct and indirect, intended and unintended effects of existing or proposed technologies.
8. Identification of an immediate programmatic context and user of the anticipated research results.

Criteria relating to future and long-term scientific potential of the United States:

9. Probable influence of the research upon the capabilities, interests, and careers of participating graduate students, postdoctoral associates, or other junior researchers.

10. Probability that the research will lead to radiation and diffusion not only of technical results but also of standards of workmanship and a tradition of excellence in the field.

11. Anticipated effect upon the instructional structure of U.S. science.

Because none of these considerations is susceptible to precise quantification or even, in most cases, to unambiguous rank ordering, it would be more accurate to speak of "factors considered" rather than "criteria." Moreover, very difficult relative weights must be attached to the factors in the case of different Foundation programs. In the evaluation of unsolicited proposals for the support of basic research projects, the overwhelming emphasis is on intrinsic scientific merit (Criteria 4 and 5). The expectation of competent performance (Criteria 1, 2, and 3) always must be present. Criteria 9, 10, and 11 also are considered with respect to each proposal. On the other hand, Criterion 8 relates only to applied research projects. Criteria 6 and 7 may be particularly applicable to applied science and engineering proposals.

The foregoing standards apply both to individual research proposals and to the separate parts of group proposals. The individual parts must be of adequate quality in their own right or of sufficient significance to achievement of the overall goals that the project could not be carried out without them. Only those parts of a group proposal that meet NSF's standards of award will be funded.

In the evaluation of proposals for specialized research equipment, the scientific merit of the research and the likelihood that the equipment will improve the quality or scope of the research (Criteria 4 and 5) are important; so too are Criteria 1 and 2, which bear on the ability of the grantee to use the equipment fully, effectively, and efficiently.

III. DECLINATIONS AND WITHDRAWAL

An applicant whose proposal for NSF grant support has been declined may request and receive from the cognizant program officer the reasons for the action. In addition, the principal investigator/project director may obtain verbatim copies of reviews, though not the names of the reviewers. If the program officer's explanation of the declination does not satisfy the principal investigator, he may request the cognizant NSF Assistant Director to reconsider the action to determine whether the proposal received a fair and impartial evaluation. The request for reconsideration must be received within 180 days of the date of the declination letter. (See NSF Important Notice 61, Exhibit II-9, *NSF Grant Policy Manual.*)

A declined proposal may be resubmitted for consideration only after it has undergone revision. The Foundation will treat the revised proposal as a new one under the usual review and evaluation procedures.

An applicant may withdraw a proposal at any time before a final decision is made. Normally NSF does not return the proposals to the applicant. The Foundation retains a file copy.

IV. GRANTS FOR OTHER PURPOSES CONNECTED WITH RESEARCH

SPECIALIZED FACILITIES

From time to time the Foundation provides assistance for the acquisition of facilities of a specialized nature. Examples include nuclear accelerators, oceanographic research vessels, major controlled-environment facilities, and specialized biological and social science facilities. Preliminary inquiry should be made before submission of a formal proposal.

FOREIGN TRAVEL

The Foundation supports international travel to assist scientists going abroad for the following purposes:

1. Attending international scientific congresses and meetings.
2. Obtaining or exchanging information in the areas of scientific research, science information, or international scientific programs and associated activities.
3. Cooperating in international scientific activities.

NSF treats as international travel all travel outside the United States and its possessions, Puerto Rico, and Canada. U.S. flag carriers must be used when such service is available (see p. 15).

International travel support may be awarded to scientific societies or other institutions in the United States for subsequent award to individual scientists for partial travel support to attend international scientific meetings. When such block awards are made, no individual travel requests will be accepted for the same meeting. Federal employees are cautioned against acting as agents for organizations in submitting proposals for such grants.

Foreign travel directly related to a research project supported by NSF should be funded out of the project grant (see p. 15).

Application forms and further information may be obtained from the Foundation's Division of International Programs.

CONFERENCES, SYMPOSIA, AND RESEARCH WORKSHOPS

The Foundation supports conferences, symposia, and research workshops in special areas of science that bring leading scientists together to discuss recent research findings or to expose other researchers or advanced graduate students to new research techniques. The Foundation encourages the convening in the United States of major international scientific conferences and assemblies of international scientific unions. Conferences will be supported only if equivalent results cannot be obtained at regular meetings of professional societies. Although requests for support of conferences, symposia, and research workshops ordinarily originate with educational institutions or scientific societies, they also may come from other groups. Concomitant support by several Federal agencies or private organizations is permissible. Since the proceedings of such meetings interest a wider group than those in attendance and normally should be published in scientific journals, requests for support may include publication costs. Requests for support generally should be made at least a year in advance of the scheduled date.

A proposal for support of a conference, symposium, or research workshop should include:

- A project summary of 200 words or less indicating the objectives of the program.
- A full statement of the need for such a gathering and the list of topics.
- Recent meetings on the same subject, including dates and places.
- Names of the chairman and members of organizing committees.
- A list of proposed participants, information on the location and probable date(s) of the meeting, and the method of announcement or invitation.
- An estimated total budget for the conference together with an itemized statement of the amount of support requested from the Foundation. The budget may include participant support for transportation, per diem costs and stipends (when appropriate), and other conference-related costs. Indirect costs are subject to negotiation with the grantee.
- Support requested or available from other Federal agencies and other contributors.

On completion of the conference, the grantee should send to NSF a brief report on the scientific highlights of the meeting (see "Grant Reports," p. 40).

DOCTORAL DISSERTATION RESEARCH

The Foundation awards grants in support of doctoral dissertation research in the following sciences: atmospheric, earth, ocean, environmental biology, behavioral, neural, and social. Further information can be obtained from the cognizant program office.

ENGINEERING RESEARCH INITIATION

The Foundation awards research-initiation grants to engineering faculty members holding full-time academic appointments as assistant or associate professor. Brochures are distributed annually and a single competition held.

SMALL-COLLEGE FACULTY OPPORTUNITY AWARDS

A faculty member at an institution with limited research opportunities may arrange to work with an investigator at another institution who holds or is applying for an NSF research grant. The grantee may request supplemental funding to cover the additional costs. If supplemental funds are required, a brief proposal, including a description of the proposed research, budget, and biographical sketch, should be submitted to NSF.

INFORMATION SCIENCE

NSF support is available for investigations on both fundamental and applied problems in information science. NSF also awards grants for research on the characteristics of scientific and technical communication systems. For further information and relevant program guidelines, contact the Division of Information Science and Technology.

OTHER RESEARCH SUPPORT ACTIVITIES

The *Guide to Programs* contains descriptions and further information on other NSF programs.

V. THE AWARD AND CONTINUED GRANT SUPPORT

GRANT AWARD

The Foundation awards two types of grants:

(1) *Standard Grants:* in which NSF agrees to support a specified level of effort for a specified period of time with no statement of NSF intent to provide additional future support. Standard grants are fully funded in a single action

(2) *Continuing Grants:* in which NSF agrees to support a specified level of effort for a specified period of time with a statement of intent to provide additional support of the project, provided funds are available and the results achieved warrant further support. Funding normally will be in one-year increments. The grant letter will state the dollar amount for each committed year. If the annual funding level exceeds $200,000, the grant letter may state an approximate support level with the provision that the actual level will be negotiated annually.

Notification of a grant award is by letter signed by the Foundation's Grants Officer, addressed to the institution to which the grant is made. Copies are included for the principal investigator and the institution's business office.

The grant period begins on the effective date specified in the grant letter or, in its absence, the date of the grant letter and runs until the expiration date indicated. The expiration date usually includes a 6-month "grace period" for which no funds are provided. Expenditures incurred before the effective date of the grant may not be charged against the grant. Expenditures after the scheduled expiration date of the grant may be made only to honor documented commitments made before the expiration date.

REQUESTS FOR RENEWAL OF SUPPORT

Proposals for renewal of a standard grant compete with all other pending proposals and should be submitted 6-9 months before additional funding is required. In preparing a renewal proposal, applicants should assume that reviewers will not have access to the previous proposals or progress reports. In additon to the material discussed in Section I, the renewal proposal should include:

1. A summary of progress to date and its relation to the proposed work.
2. A statement, by categories in the existing grant budget, of expenditures to the date of preparation of the renewal proposal, and of commitments and estimated expenditures to the requested effective date of the renewal grant. If commitments exist or are anticipated that will require the expenditure of any residual funds after the renewal date, they should be explained.
3. A proposed budget for the ensuing period.

For continuing grants, additional funding beyond the approved full term will require competitive review of a new proposal.

Incremental funding for continuing grants within the approved term is based on Foundation staff review of progress reports and proposed budgets and does not require submission of a new proposal. For each increment, two copies of an endorsed request, addressed to the cognizant program office, must be received by the Foundation at least 3 months before the end of the period currently being funded. Requests need only include:

1. A brief summary of scientific progress.

2. A statement of funds estimated to remain unobligated at the end of the period for which NSF currently is providing support; the amount to be carried forward (up to 10 percent of the amount of the current increment); and the residual amount in excess of 10 percent. Only with NSF approval based on adequate justification can amounts in excess of 10 percent of the current increment be carried forward as an addition to the next increment.

3. Three copies of a proposed budget for the ensuing year in the NSF format (Appendix III). (Indicate on line P any residual amount *in excess* of 10 percent of the current increment.)

4. Current information about other research support of senior personnel (see p. 18 and Appendix IV).

5. Updated Institutional Biohazard Committee and Human Subjects Certifications.

NO-COST EXTENSIONS

If additional time beyond the established expiration date of a grant is required to assure adequate completion of the original scope of work within the funds already granted, a no-cost extension may be requested. Normally NSF will authorize no-cost extentions only in the final year, and no single extension may exceed 12 months. For continuing grants, both the interim and final expiration dates may be extended; but the total extension period is limited to 18 months, of which no more than 6 months of the extra time will be permitted before the end of the final support period. Only in exceptional cases will the Foundation approve more than one extension.

Two copies of a request for a no-cost extension, signed by the principal investigator and the authorized organizational representative, must be received by the cognizant program office at least 45 days before the current expiration date of the grant award. The request must fully explain the need for the extension and include an estimate of the unobligated funds remaining and a plan for their use. This plan must coincide with the original or amended objectives of the project. That unobligated funds remain at the expiration of the award is not in itself sufficient justification for an extension.

An approved no-cost extension will be in the form of a formal amendment to the grant specifying a new expiration date.

VI. GRANT ADMINISTRATION HIGHLIGHTS

The administration of research grants is governed by the conditions of the grant instrument. The following information on grant administration deals with questions that investigators often raise. The *NSF Grant Policy Manual* sets forth these and other administrative requirements.

Primary responsibility for general supervision of all grant activities rests with the grantee institution. The principal investigator is responsible for the conduct of the scientific work and the publication of it results and is expected to provide technical leadership to the project whether or not any salary is provided from grant funds.

NSF encourages grantees and principal investigators to seek its advice on administrative problems that may arise. Such advice does not imply an assumption of responsibility by the Foundation for final decisions.

INSTITUTIONS APPLYING FOR THE FIRST TIME

Grants for Federal financial assistance are subject to certain general requirements, such as compliance with the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, and other laws and regulations prohibiting unlawful discrimination; patent and copyright requirements; cost sharing; the use of U.S. flag carriers for international travel; and the use of foreign currency as appropriate to accomplish the objectives of the project. Organizations that have not previously received an NSF grant should, at the time of application, contact the Division of Grants and Contracts for instructions on the submission of data on organization and management.

ADHERENCE TO ORIGINAL RESEARCH OBJECTIVES

The principal investigator should feel free to pursue important leads that may arise during the conduct of the research. NSF support will not be jeopardized for the remainder of the grant period if the principal investigator discontinues or materially modifies the originally planned line of inquiry in favor of one that appears to have more scientific promise. NSF must give prior approval, however, when a modification would result in a major deviation from the original research objective or would include research activities specifically excluded from support when the award was negotiated.

ADHERENCE TO ORIGINAL BUDGET ESTIMATES

The grant instrument includes or refers to a budget that lists the items for which funds are provided. While the principal investigator has reasonable flexibility to alter the direction of research when changes seem scientifically advantageous, the grantee institution must consider the effect of any budget reallocations on the indirect cost portions of the budget and must observe the conditions prescribed by the award. Of particular interest to principal investigators are the following conditions that require specific, written, prior approval by the Foundation or the grantee institution's prior approval system for the costs to be reallocated within a previously approved grant budget.

Type of Expenditures	Prior Approval Required
1. Alterations and renovations	
a. Under $1,000	OPAS*
b. $1,000 or more	Grants officer
2. Capital expenditures for land, buildings, or repairs	Grants officer
3. Contractual (third party) costs	Grants officer
4. Equipment	
a. Special purpose: $1,000 or more	Program officer
b. General purpose	Grants officer
c. Cumulative expenditures that exceed budgeted amount by more than 25%	OPAS*
5. News release costs	Program officer
6. Participant support costs: transfer of funds to other categories of expense	Program officer
7. Pre-award costs	Grants officer
8. Production or distribution of books, films, etc.	Grants officer
9. Rental or lease of facilities	Grants officer
10. Travel	
a. Each foreign trip and its costs	Program officer
b. Cumulative domestic travel expenditures that exceed (1) 25% of amount budgeted or $500, whichever is greater; or (2) $500 when no (zero) funds are budgeted	
11. Hiring Consultants	OPAS*
a. Not provided for in grant proposal or award	

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* Organizational Prior Approval System (see *NSF Grant Policy Manual*, Sec. 613).

When a budget change requires NSF approval, two copies of a request, signed by the principal investigator and by the grantee institution's authorized official, should be sent to the cognizant NSF office. The request should clearly state which budget items are to be changed and by what amounts and should explain the reasons for the changes.

CHANGES IN PERSONNEL

Written Foundation approval is required for any permanent change in senior personnel or for any temporary change in excess of 3 months, such as an investigator taking sabbatical leave. Further, NSF must be informed when it appears that a principal investigator or other senior personnel will devote substantially less effort to the work than anticipated in the approved proposal. Support from group grants for senior personnel not specifically included in the grant budget or in a subgroup under one of the approved investigators requires prior written approval, which is based on review of a research proposal from the investigator to be included.

TRANSFER OF PRINCIPAL INVESTIGATOR

The Foundation does not transfer grants from one institution to another. If a principal investigator changes organizational affiliation, a new proposal may be initiated through the new institution. The original grantee institution may terminate the grant or, when appropriate, propose a substitute principal investigator to continue the research. NSF encourages the principal investigator and the appropriate representatives of the grantee institution or the new institution to consult with the cognizant program officer if such changes are anticipated.

EQUIPMENT

Title to equipment purchased or fabricated by an academic institution or other nonprofit organization with NSF grant funds normally vests in the grantee institution. Special situations may require that title be vested in the Government or that NSF reserve the right to require the grantee to transfer title to the Government or a third party on expiration of the grant. Title to equipment acquired through an NSF grant by a small business or other commercial firm normally will vest in the Government. When title to specialized research equipment purchased with grant funds vests in the grantee institution and the principal investigator transfers to another nonprofit institution, NSF may encourage transfer of the equipment to the new institution provided it is not required at the institution holding title, the cost of transfer is not excessive, and the principal investigator continues the research at the new location.

SUBCONTRACTS

If a subcontract becomes necessary after a grant has been made, the grantee must submit for NSF approval the proposed performance statement and budget, a statement indicating the basis for selection of the contractor, and a justification of the proposed arrangement. The request must be signed by the principal investigator and endorsed by the authorized institutional official.

EXCESS GOVERNMENT PROPERTY

As a means of providing additional support and conserving supply and equipment funds, the Foundation may sponsor the transfer of a limited quantity of excess Government property to an NSF grantee. To receive information concerning the availability of property, an eligible grantee should request in writing that the Project Property Section of the Foundation make arrangements to place the grantee on the General Services Administration's mailing list for information on the availability of property. Before transfer of excess Government property can be authorized, justification must be provided to the Foundation by the grantee that the property will further the objectives of an active NSF grant. (See Important Notice 58, Exhibit VII-3, *NSF Grant Policy Manual*.)

TERMINATION OF GRANTS

Foundation grants may be terminated for cause in accordance with the procedures contained in the Grant General Conditions. Grants also may be terminated by mutual agreement. Termination by mutual agreement shall not affect any financial commitment of grant funds that, in the judgment of the Foundation and the grantee, had become firm before the effective date of the termination.

GRANT REPORTS

ANNUAL PROGRESS REPORTS

For multi-year grants, principal investigators are required to submit a technical progress report to the cognizant NSF program officer annually. The report should briefly summarize activity during the past year, identify any significant scientific developments, and describe any problems encountered. Two reprints of each publication should be provided as soon as they are available.

FINAL REPORTS

Within 90 days after the expiration of a grant, the grantee is required to submit final expenditure information and a Final Project

Report (NSF Form 98A). Final expenditure information is supplied by grantees in the quarterly Federal Cash Transactions Report (SF 272). The NSF version of this report is a computer listing, furnished by the Foundation, listing all NSF grants at the institution. Instructions for completing this report will be found in the *NSF Grant Policy Manual.* NSF extracts all the fiscal information needed to close out awards from the Federal Cash Transactions Report and does not require grantees to submit a separate Financial Status Report (SF 269) for each completed award.

The Final Project Report, which includes the items listed in Part III, contains the technical information needed by the Foundation for purposes of program management and informing the public about the results of research it supports. A copy of the form and the associated instructions are attached in Appendix VI.

OTHER REPORTS

Some NSF awards may require unique reports or other end products in addition to those described above. In these cases, special provisions will be included in the award instrument.

The cognizant NSF program officer should be informed of research results of unusual interest whenever they become available.

ACKNOWLEDGMENT OF SUPPORT AND DISCLAIMER

Any publication based on research activity supported by the Foundation must contain the following acknowledgment: "This material is based upon work supported by the National Science Foundation under Grant ______________." All materials, except scientific articles or papers published in scientific journals, also must contain the following statement: "Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the National Science Foundation."

PROPOSAL AS PUBLIC RECORD

A proposal that results in an NSF grant becomes part of the record of the transaction and will be available to the public on specific request. Information or material that the Foundation and the grantee mutually agree to be of a privileged nature will be held in confidence to the extent permitted by law, including the Freedom of Information Act (5 U.S.C. 552). Without assuming any liability for inadvertent disclosure, NSF will seek to limit dissemination of such information to its employees and, when necessary for evaluation of the proposal, to outside reviewers. Accordingly, any privileged information should be in a separate, accompanying statement bearing a legend similar to the following: "Following is (proprietary) (specify) information that (name of proposing organization) requests not be released to persons outside the Government, except for purposes of evaluation."

A proposal that does not result in an NSF grant will be retained by the Foundation but will be released to the public only with the consent of the proposer, or to the extent required by law.

INVENTIONS, SOFTWARE, AND COPYRIGHTS

Each Foundation grant in support of research is subject to a patent and invention clause. This clause governs, in a manner calculated to protect the public interest and the equities of the grantee, the disposition of inventions made or conceived under the grant. Generally, it provides that, whenever an invention is conceived or first actually reduced to practice by the grantee or its employees in the course of a research grant, the grantee must furnish the Foundation with complete information thereon. The Foundation will determine whether a patent application should be filed and the disposition of the invention and rights in any resulting application or patent.

Grants for support of data banks or the creation of computer software of wide usefulness are subject to conditions reserving to the Foundation and to the general public certain rights of access to these data.

The Foundation encourages the publication and distribution of the results of research performed under its grants. Generally, publication is in scientific journals or similar media. The Government retains the right to use published materials and unpublished technical reports resulting from the performance of work under an NSF grant. The Foundation may arrange for the dissemination of substantive technical reports through the National Technical Information Service (NTIS) of the Department of Commerce to assure adequate dissemination of new or significant scientific knowledge. NSF must give advance approval for commercial publication or distribution of papers, monographs, proceedings, films, or other works produced under its grants.

APPENDIX I

PROPOSAL TO THE NATI

Cover

FOR CONSIDERATION BY NSF ORGANIZATIONAL UNIT
(Indicate the most specific unit known, i.e. program, division, etc.)

PROGRAM ANNOUNCEMENT SOLICITATION NO.

NAME OF SUBMITTING ORGANIZATION TO WHICH AWARD SH

ADDRESS OF ORGANIZATION (INCLUDE ZIP CODE)

TITLE OF PROPOSED PROJECT

REQUESTED AMOUNT	PROPOSED DURATIO
PI/PD DEPARTMENT	PI/PD ORG
PI/PD NAME	SOCIAL S
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ADDITIONAL PI/PD	
ADDITIONAL PI/PD	
ADDITIONAL PI/PD	

FOR RENEWAL OR CONTINUING AWARD REQUEST, LIST
PREVIOUS AWARD NO.

* Submission of SSN and other personal data is voluntary and will no
an integral part of the NSF information system and assist in processi

CHECK APPROPRIATE BOX(ES) IF THIS PROPOSAL INCL

☐ Animal Welfare ☐ Human Subjects

☐ Endangered Species ☐ Marine Mammal Protection

☐ Historical Sites ☐ Pollution Control

PRINCIPAL INVESTIGATOR/ PROJECT DIRECTOR	AUTHORIZED OR
NAME	NAME
SIGNATURE	SIGNATURE
TITLE	TITLE
DATE	DATE

AL SCIENCE FOUNDATION
ge

IS THIS PROPOSAL BEING SUBMITTED TO ANOTHER FEDERAL AGENCY? YES ___ NO ___ IF YES, LIST ACRONYM(S)

SING DATE (IF ANY)

D BE MADE (INCLUDE BRANCH/CAMPUS/OTHER COMPONENTS)

DESIRED STARTING DATE

ATION

PI/PD PHONE NO.

ITY NO.*	DATE OF HIGHEST DEGREE ACHIEVED*	MALE*	FEMALE*

UBMITTING ORGANIZATION IS A SMALL BUSINESS CONCERN
CK HERE ☐ (See CFR Title 13, Part 121 for Definitions)

t the organization's eligibility for an award. However, they are
posals. SSN solicited under NSF Act of 1950, as amended.

ANY OF THE ITEMS LISTED BELOW

☐ National Environmental Policy Act

☐ Research Involving Recombinant DNA Molecules

☐ Proprietary and Privileged Information

ATIONAL REP.	OTHER ENDORSEMENT (optional)
	NAME
	SIGNATURE
	TITLE
	DATE

APPENDIX II

NOTICE OF RE
SCIENCE INFOR

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NATIONAL SCIE
PROJEC

1. NAME OF INSTITUTION (INCLUDE BRANCH CAMPUS & SC

2. MAILING ADDRESS

3. PRINCIPAL INVESTIGATOR AND FIELD OF SCIENCE SPECI

4. TITLE OF PROJECT

5. SUMMARY OF PROPOSED WORK (LIMIT TO 22 PICA OR 1

FOR NS

DIVISION (OFFICE) AND DIRECTORATE

SECTION

FOR DG

START AND END DATES

NSF FORM 4 (7-78) 1. Proposal Folder 3. Division of Grants &
2. Program Suspense 4. Science Information

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6 Off of Gov't & Pub Progs Director

APPENDIX III

SU
PROPOS

	ORGANIZATION AND ADDRESS
	PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR
	A. SENIOR PERSONNEL (LIST BY NAME; SHOW NUMBERS BRACKETS. SALARY AMOUNTS MAY BE LISTED ON SCHEDULE) GPM 205.16
	1. P.I./P.D.
	2. CO P.I./P.D.
NSF USE	3. CO P.I./P.D.
	4. CO P.I./P.D.
	5. CO P.I./P.D.
11115	6. ( ) ◄—— SUBTOTALS A1 - A5
	FACULTY AND OTHER SENIOR ASSOCIATES [ATTACH IF NECES
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	8.
	9.
	10.
	11.
11117	12. ( ) ◄ —— SUBTOTALS A7 - A11
	B. OTHER PERSONNEL (LIST NUMBERS IN BRACKETS)
11141	1. ( ) POSTDOCTORAL ASSOCIATES
11149	2. ( ) OTHER PROFESSIONALS
11150	3. ( ) GRADUATE STUDENTS
11152	4. ( ) UNDERGRADUATE STUDENTS
11182	5. ( ) SECRETARIAL - CLERICAL
11183	6. ( ) TECHNICAL, SHOP, OTHER
	TOTAL SALARIES AND WAGES (A+B)
11200	**C. FRINGE BENEFITS** (IF CHARGED AS DIRECT COSTS)
	TOTAL SALARIES, WAGES AND FRINGE BENEFITS
	D. EQUIPMENT (LIST ITEMS AND DOLLAR AMOUNTS F
23181	TOTAL EQUIPMENT
	E. MATERIALS AND SUPPLIES
32630	
	F. DOMESTIC TRAVEL
42111	
	G. FOREIGN TRAVEL (LIST DESTINATION AND AMOUN
42112	

PAGE 1 of 2 PAGES

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UDGET

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SUMMARY

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62315	**I. COMPUTER (ADPE) SERVICES**
	J. CONSULTANT SERVICES (IDENTIFY CONSULTANTS
	K. PARTICIPANT SUPPORT COSTS, IF ALLOWED BY PR
	1. STIPENDS
	2. TRAVEL
	3. SUBSISTENCE
	4. OTHER SPECIFY
	5. TOTAL PARTICIPANT COSTS (K1 + K2 + K3 + K4
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	M. TOTAL DIRECT COSTS (A THROUGH L)
	N. INDIRECT COSTS (Specify rate(s) and base(s) for on/off identify itemized costs included in on/off campus bases in
74100	TOTAL INDIRECT COSTS
	O. TOTAL DIRECT AND INDIRECT COSTS (M + N)
74500	**P. LESS RESIDUAL FUNDS** (If for further support of curre
75000	**Q. AMOUNT OF THIS REQUEST** (O MINUS P)

REMARKS

NOTE: SIGNATURES REQUIRED ONLY FOR REVISED BU

SIGNATURE OF PRINCIPAL INVESTIGATOR/PROJECT DI

SIGNATURE OF AUTHORIZED ORGANIZATIONAL REPRE

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INDIRECT COST RATE VERIFICATION

Date Checked	Date of Rate Sheet	Signature

Grant Number	Amend No.	Institution

	Proposal Number	Dur.	Chg.

PAGE 2 of 2 PAGES

SAL BUDGET

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GPM 252 and 253;	$	$
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M 233). THIS IS REVISION NO.

	DATE OF SIGNATURE	TYPED OR PRINTED NAME AND TITLE
E	DATE OF SIGNATURE	TYPED OR PRINTED NAME AND TITLE

ONLY

ROGRAM OFFICER APPROVAL

h	Fund Acct.	Program	Object	

Date	Proposed Amount	Propsd. Dur.	

SUMMARY PROPOSAL BUDGET EXPLANATORY REMARKS

The personnel categories listed in Part A of the summary are defined as follows:

A. *Senior Personnel*

1. *(Co) Principal Investigator(s)* are individual(s) so designated by the grantee institution.
2. *A Faculty Associate* (faculty member) is an individual—other than the Principal Investigator—who is considered by the performing institution to be a member of its faculty or who holds an appointment as a faculty member at another institution, and who will participate in the project being supported.

B. *Other personnel*

1. *A Postdoctoral Associate* is an individual who received a Ph.D., M.D., D.Sc., or equivalent degree less than 5 years ago, who is not a member of the faculty of the performing institution, and who is not reported under Senior Personnel above.
2. *Other Professional* is a person who may or may not hold a doctoral degree or its equivalent, who is considered professional and is not reported as a Principal Investigator, faculty associate, postdoctoral associate, or student. Examples of persons included in this category are doctoral associates not reported under B1 above, professional technicians, mathematicians, physicians, veterinarians, system experts, computer programmers, and design engineers.
3. *A Graduate Student* (Research assistant) is a part-time or full-time student working on the project in a research capacity who holds at least a bachelor's degree or its

equivalent and is enrolled in a degree program leading to an advanced degree.

4. *An Undergraduate Student* is a student who is enrolled in a degree program (part-time or full-time) leading to a bachelor's degree.

5.&6. These include persons working on the project in a nonresearch capacity, such as secretaries, clerk-typists, draftsmen, animal caretakers, electricians, and custodial personnel, regardless of whether they hold a degree or are involved in degree work.

Any personnel category for which NSF funds are requested should indicate the number of different persons expected to receive some support from those funds, and, where called for on the budget format, the full-time equivalent (FTE) man-months to the nearest tenth.

APPENDIX IV

Current a

The following information should be provided
Failure to provide this information may delay

A

Suppo
Ager

I. (Name of Principal Investigator)
  A. *Current Support*
    List—If none, Report none
  B. *Proposals Pending*
    1. List this proposal
    2. Other pending proposals, including renewal applications
    3. Proposals planned to be submitted in near future

II. (Name of co-principal investigator and/or faculty associate)
  A.
  B.

III. Transfer of Support
If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

IV. (Other agencies to which this proposal has been/will be submitted)

nding Support

h investigator and other senior personnel (see p. 18).
eration of the proposal.

B	C	D	E		F
roject Title	Award Amount (or Annual Rate)	Period Covered By Award	Man-Months Or % of Effort Committed To The Project		Location Where Research Is/Will Be Performed
			ACAD.	SUMM.	
——	——	——	——	——	——
——	——	——	——	——	——
——	——	——	——	——	——
——	——	——	——	——	——
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——	——	——	——	——	——

APPENDIX V

CHECK LIST FOR PROPOSAL SUBMISSION

Complete proposals help to expedite review and assist the applicant to meet a planned program. To assure that research proposals submitted to the Foundation are complete, an administrative check should be made before mailing.

- ☐ Cover page (use requested format)
- ☐ Appropriate boxes under REMARKS on cover page checked
- ☐ All required signatures
- ☐ Table of contents
- ☐ Project summary (less than 200 words)
- ☐ Summary of progress to date and its relation to proposed work (renewals only)
- ☐ Detailed description of proposed research
- ☐ Bibliography of pertinent literature
- ☐ Vitae of all senior personnel
- ☐ Current list of main publications of senior personnel (major publications currently in press may be listed)
- ☐ Budget in requested format
- ☐ Brief description and justification of major items of requested equipment
- ☐ Brief description of type and extent of travel and its relationship to the research
- ☐ Current and pending support (see Appendix IV)
- ☐ List or description of available facilities and major items of equipment to be used in the proposed research
- ☐ Required number of copies of the proposal, including the original signed copy (see Appendix VII)

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APPENDIX VI

NATIONAL SCIENCE FOUNDATION
Washington, D.C. 20550

FINAL P

PLEASE READ INSTRUCTIO

PART I–PROJECT ID

1. Institution and Address

2.

4.

6. Project Title

PART II–SUMMARY OF COM

PART III–TECHNICAL INFORMAT

1. ITEM *(Check appropriate blocks)*	
a. Abstracts of Theses	
b. Publication Citations	
c. Data on Scientific Collaborators	
d. Information or Inventions	
e. Technical Description of Project and Results	▨
f. Other *(specify)*	▨
2. Principal Investigator/Project Director Name *(Typed)*	3.

NSF Form 98A (5-78) Supersedes All Previous Editions

T REPORT

I 98A

VERSE BEFORE COMPLETING

ATION INFORMATION

ram	3. NSF Award Number
riod To	5. Cumulative Award Amount

PROJECT *(FOR PUBLIC USE)*

PROGRAM MANAGEMENT USES)

	ATTACHED	PREVIOUSLY FURNISHED	TO BE FURNISHED SEPARATELY TO PROGRAM	
			Check (✓)	Approx. Date

estigator Project Director Signature	4. Date

Form Approved OMB No. 99R0011

INSTRUCTIONS

This report is due within 90 days after the expiration o

National Scie
Division of G
Post-Award P
1800 G Stree
Washington,

INSTRU

These identifying data items should be the same as on t

INSTRU

The summary (about 200 words) must be self-conta
restating the project title, it should begin with a topic
include, if pertinent to the project being described,

- The primary objectives and scope of the proje
- The techniques or approaches used only to the
- The findings and implications stated as concise

This summary will be published in an annual NSF re
to answer inquiries by nonscientists as to the
abbreviations should be avoided.

INSTRU

Items in Part III may, but need not, be submitted wit
block next to each item to indicate the status of y

a. Self-explanatory.
b. For publications (published and planned) include
copies of any reprints as they become available.
c. Scientific Collaborators: provide a list of co-inves
Include title or status, e.g. associate professor, g
d. Briefly describe any inventions which resulted fr
e. Provide a technical summary of the activities and
updated as necessary, may be used to fulfill this
f. Include any additional material, either specificall
products such as films, books, studies) or which

L PROJECT REPORT
98A)

. It should be submitted in two copies to:

tion
ontracts
nch

DR PART I

ocuments.

DR PART II

ntelligible to a scientifically literate reader. Without
tating the project's major thesis. The summary should
ng items:

essary for comprehension.

rmatively as possible.

rs should also be aware that the summary may be used
significance of the research. Scientific jargon and

R PART III

Project Report. Place a check mark in the appropriate
ion.

l or other reference, date, and authors. Provide two

arch assistants and others associated with the project.
nt, etc.
ct and the status of pending patent applications, if any.
information supplied in proposals for further support,

the award instrument (e.g. special technical reports or
would be useful to the Foundation.

APPENDIX VII

Programs Providing Scientific Research Support

Required number of proposals in parentheses	*Tel No.*
Astronomy (10)	
Galactic and Extragalactic Astronomy	632-4192
Solar System	632-4186
Stars and Stellar Evolution	632-4188
Stellar Systems and Motions	632-4186
Atmospheric Sciences (10)	
Aeronomy	632-4185
Atmospheric Chemistry	632-4198
Meteorology	632-4190
Solar Terrestrial	632-4184
Climate Dynamics	634-1546
Global Atmospheric Research Program	634-1538
Behavioral and Neural Sciences (20)	
Neurobiology	634-4036
Sensory Physiology and Perception	634-1624
Social and Developmental Psychology	632-5714
Psychobiology	632-4264
Memory & Cognitive Processes	634-1583
Anthropology	632-4208
Linguistics	254-6326
Chemistry (10)	
Synthetic Inorganic and Organometallic Chemistry	634-4381

Area Code 202

Synthetic Organic and Natural Products Chemistry	634-4381
Chemical Analysis	634-4276
Chemical Instrumentation (15)	632-4276
Structural Chemistry	632-7418
Chemical Thermodynamics	632-7418
Quantum Chemistry	632-4266
Chemical Dynamics	632-4272

Earth Sciences (20)

Geochemistry	632-4213
Geology	632-4218
Geophysics	632-4219

Engineering (10)

Chemical Processes	632-5867
Heat Transfer	632-5867
Particulate and Multiphase Processes	632-5867
Thermodynamics and Mass Transfer	632-5867
Structural, Materials and Geotechnical Engineering	632-5787
Fluid Mechanics	632-5787
Solid Mechanics	632-5787
Water Resources, Urban, and Environmental Engineering	632-5787
Automation, Bioengineering, and Sensing Systems	632-5881
Devices and Waves	632-5881
Electrical and Optical Communications	632-5881
System Theory and Application	632-5881

Environmental Biology (20)

Ecosystem Studies	632-5854
Ecology	632-7324
Systematic Biology	632-5846
Biological Research Resources	634-4135
Population Biology and Physiological Ecology	632-7317

Information Science and Technology (15)	632-5824
International Programs (10)	632-5798
Materials (10)	
Ceramics	632-7406
Condensed Matter Theory	632-7334
Low-Temperature Physics	632-7404
Metallurgy	632-7406
Polymers	632-7406
Solid State Chemistry	632-7404
Solid State Physics	632-7334
Materials Research Laboratories (15)	632-7408
Mathematical and Computer Sciences (10)	
Algebra	632-7377
Applied Mathematics and Statistics	632-7377
Classical Analysis and Geometry	632-7377
Modern Analysis and Probability	632-7377
Topology and Foundations	632-7377
Theoretical Computer Science	632-7346
Software Systems Science	632-7346
Computer Systems Design	632-7346
Intelligent Systems	632-5743
Software Engineering	632-5743
Special Projects	632-5747
Oceanograpy (20)	
Biological Oceanography	632-5858
Marine Chemistry	632-4212
Physical Oceanography	632-4236
Submarine Geology and Geophysics	632-4215

Area Code 202

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*20 for group research, large facilities construction, modification, or operation

Physics (15*)

Atomic, Molcular, and Plasma Physics	632-4322
Elementary Particle Physics	632-5830
Gravitational Physics	632-4302
Intermediate Energy Physics	632-4317
Nuclear Physics	632-4317
Theoretical Physics	632-4302

Physiology, Cellular & Molecular Biology (20)

Developmental Biology	632-4314
Genetic Biology	632-5985
Cell Biology	634-4117
Human Cell Biology	632-4200
Biochemistry	632-4260
Biophysics	632-4260
Regulatory Biology	632-4298
Metabolic Biology	632-4312
Biological Instrumentation	653-5339

Polar Sciences (15)

Advanced Systems Applications and Glaciology	632-4162
Polar Atmospheric Sciences	632-4162
Polar Biology and Medicine	632-4162
Polar Earth Sciences	632-4162
Polar Meterology	632-4162
Polar Ocean Sciences	632-4162

Social Sciences (20)

Economics	632-5968
Geography and Regional Science	634-6683
Law and Social Sciences	632-5816
Political Science	632-4348
Sociology	632-4204
Special Projects & Social Indicators	632-4216
History & Philosophy of Science	632-5972

Area Code 202

END

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ORIGINAL

GRANTS FOR SCIENTIFIC RESEARCH

COMPLETED

NATIONAL SCIENCE
FOUNDATION

NSF 78-41

In accordance with Federal statutes and regulations and NSF policies, no person on grounds of race, color, age, sex, national origin, or physical handicap shall be excluded from participation in, denied the benefits of, or be subject to discrimination under any program or activity receiving financial assistance from the National Science Foundation.

This brochure provides general information about the NSF grant process for research projects and grant administration highlights. It serves as an aid in preparing proposals. The *NSF Grant Policy Manual* (NSF 77-47) contains comprehensive statements of NSF policy and sets forth the actual terms and conditions under which awards will be made. All proposers and prospective grantees should refer to the *Manual* or to NSF published regulations appearing in Chapter VI of Title 45 of the Code of Federal Regulations for specific, detailed information.

Any or all portions of this brochure may be reproduced with the exception of the postal frank.

FOREWORD

The National Science Foundation Act of 1950, as amended, authorizes the Foundation to initiate and support scientific research and programs to strengthen scientific research potential.

The Foundation carries out its statutory responsibilities for the support of research, including applied research, through a number of programs. Fundamental research in all scientific disciplines is supported in several NSF directorates. The Foundation's *Guide to Programs* and other brochures or announcements contain information about other programs (see NSF *List of Publications*). These brochures are available from: Publications, National Science Foundation, Washington, D.C. 20550.

Although many provisions of this brochure apply to all research programs, *the guidelines and instructions on the following pages are directed specifically to the interests of investigators applying for support of projects in fundamental or basic research and other closely related activities,* such as foreign travel, conferences, symposia, and research equipment and facilities. Sources of additional information on these related activities are noted in the text. Through such support, the Foundation assists individual scientists or groups of scientists who seek answers to questions concerning fundamental scientific processes and forces, natural laws, and phenomena in any recognized scientific discipline.

Business officers and administrators should refer also to the more comprehensive information in the *NSF Grant Policy Manual,* which is available only by subscription, $12 domestic and $15 foreign, from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. This looseleaf manual, identified by GPO as NSF 77-47, will be updated periodically through supplements, which will be furnished automatically to subscribers.

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CONTENTS

Page

I. Guidelines for Preparation of Proposals 1

Types of Research Supported 1
The Proposal 1
Who May Submit 1
When to Submit 2
Where to Submit 2
What to Submit 3
  Cover Page 3
  Table of Contents 4
  Project Summary 4
  Project Description 4
  Bibliography 4
  Biographical Sketches 4
  Budget 4
    Salaries and Wages 4
    Research Assistantships 5
    Fringe Benefits 5
    Equipment 5
    Materials and Supplies 5
    Domestic Travel 6
    Foreign Travel 6
    Publication Costs/Page Charges 6
    Computer (ADPE) Services 6
    Consultant Services 6
    Participant Support Costs 6
    Other Direct Costs 6
    Indirect Costs 7
  Current and Pending Support 7
  Appendixes 7
    Facilities 7
    Special Considerations 8

II. Proposal Processing and Evaluation 9

III. Declinations and Withdrawals 11

IV. Grants for Other Purposes Connected with Research 12

Specialized Facilities 12
Foreign Travel 12
Conferences, Symposia, and Research Workshops 12
Doctoral Dissertation Research 13
Engineering Research Initiation 13
Small-College Faculty Opportunity Awards 13
Information Science 13
Other Research Support Activities 13

V. The Award and Continued Grant Support 14

Grant Award 14
Requests for Renewal of Support 14
No-Cost Extensions 15

VI. Grant Administration Highlights 16

Institutions Applying for the First Time 16
Adherence to Original Research Objectives 16
Adherence to Original Budget Estimates 16
Changes in Personnel 17
Transfer of Principal Investigator 17
Equipment 17
Subcontracts 17
Excess Government Property 17
Termination of Grants 18
Grant Reports 18
Acknowledgment of Support and Disclaimer 18
Proposal as Public Record 18
Inventions, Software, and Copyrights 18

VII. Appendixes 20

I. Cover Page Format 20
II. Project Summary 21
III. Summary Proposal Budget Format 22
IV. Current and Pending Support 25
V. Check List for Proposal Submission 26
VI. Final Project Report 27
VII. Programs Providing Scientific Research Support 29
VIII. Addendum: Unsolicited Proposals to Certain Engineering and Applied Science (EAS) Divisions 31

I. GUIDELINES FOR PREPARATION OF PROPOSALS

TYPES OF RESEARCH SUPPORTED

The Foundation considers proposals for support of research in any field of science, including but not necessarily limited to: astronomy, atmospheric sciences, biological and behavioral sciences, chemistry, computer sciences, earth sciences, engineering, information science, mathematical sciences, materials, oceanography, physics, and social sciences. Interdisciplinary proposals also are eligible for consideration. (For a list of program areas, see Appendix VII.)

NSF normally will not support clinical research (diagnosis or treatment of disease, abnormality, or malfunction in people or animals or testing of drugs or procedures for their treatment) or research requiring security classification.

Proposals may be submitted by individuals or groups for support of research or research equipment.

Group Research Proposals

The term "group research proposal" describes a research project combining into one administrative mechanism several projects that ordinarily could be funded separately. A single scientist bears primary responsibility for the administration of the grant and discussions with the Foundation. These grants support the research of groups of scientists who *themselves* judge that the effectiveness of their research would be enhanced by group funding. They may prefer to be supported as a group because their research is inherently a group activity, or there may be valuable flexibility in the allocation of funds through the administration of a single account. Greater flexibility in using funds to support technicians or to buy equipment is one such advantage; the ability to follow up breakthroughs or to deal with unforeseen problems is another.

The institution must assure NSF that the proposed activity is administratively manageable. NSF may request a revised proposal if it believes that the project is so complex that it will be too difficult to review or administer.

Research Equipment Proposals

Proposals for specialized research equipment may be submitted by an institution for individual investigators or groups of investigators within the same department, from several departments, a school, an institution, or a region. Investigators may be working in related areas, or their research may be truly multidisciplinary. Equipment proposals (20 copies are required) should follow the format of research proposals; special considerations are noted at appropriate places in the text of this brochure.

THE PROPOSAL

The proposal should present the (1) objectives and scientific significance of the proposed work; (2) suitability of the methods to be employed; (3) qualifications of the investigator and the grantee institution; and (4) amount of funding required. Since the proposal will compete with others on related topics, using the procedures and criteria described in Section II of this brochure, it should present the scientific merit of the proposed project clearly and convincingly and should be prepared with the care and thoroughness of a paper submitted for publication. The proposal should be reviewed carefully to ensure that all essential data are included or summarized, unless they are readily available in published literature. Omissions frequently generate additional correspondence and delay processing. A checklist is included (see Appendix V).

WHO MAY SUBMIT

Scientists usually initiate research proposals, which are submitted by their employing organizations. Before formal submission the proposal may be discussed with NSF staff, either by letter, telephone, or in person. Graduate students are not encouraged to submit research proposals (except for Doctoral Dissertation Research Grants, discussed in Section IV). Normally they should apply for fellowship support or arrange to serve as research assistants to faculty members.

The following limitations refer specifically to submission of proposals for scientific research support. Eligibility of institutions and investigators may vary in other NSF programs (see *Guide to Programs).*

Categories of Applicants

(1) *Universities and colleges:* U.S. universities and colleges, acting on behalf of their faculty members, submit most research proposals. See also No. 3 below.

(2) *Nonprofit, nonacademic research institutions:* NSF accepts proposals from independent museums, observatories, research laboratories, professional societies, and other similar organizations that are directly associated with educational or research activities of academic institutions. Other types of nonprofit, nonacademic institutions normally will receive NSF basic research grants only when the proposed research is judged to be of special significance or the institution has special capabilities.

(3) *Private profit organizations:* The Foundation welcomes unsolicited research proposals from commercial firms, but it also wants to avoid substituting Federal support for normal commercial investment in research or compromising the vitality of research in educational institutions, where research makes a special added contribution to science education. Thus, an unsolicited research proposal from a commercial firm may be funded when (a) the project is of special concern from a national point of view, (b) special resources are available in industry for the work; or (c) the proposed project is especially meritorious. NSF is interested in supporting research projects that couple industrial research resources and perspectives with those of universities. Therefore, it especially welcomes proposals for cooperative research projects involving both universities and industry.

(4) *Foreign institutions:* Although NSF rarely provides U.S. dollar support for research by foreign institutions, they may obtain financial support through U.S.-owned excess foreign currencies under the Special Foreign Currency Program. NSF also considers proposals for cooperative research projects involving U.S. and foreign institutions provided support is requested only for the U.S. portion of the collaborative effort. (For further information and program guidelines, contact the Division of International Programs.)

(5) *Other Federal agencies:* Scientists employed by other Federal agencies are not encouraged to submit unsolicited research proposals to NSF. In special circumstances, however, Federal scientists may receive research support if they can demonstrate that it will serve more efficiently than other means the research needs of scientists from academic or academically related institutions. Preliminary inquiry must be made to the appropriate program (see Appendix VII) before a formal proposal may be considered.

(6) *Unaffiliated scientists in the United States:* Scientists in the United States who have no affiliations with organizations that could act as grantee institutions may receive support for meritorious research if they have the capability and facilities needed to perform the work, agree to fiscal arrangements satisfactory to the NSF Grants Officer, and otherwise meet the conditions described in this brochure. Unaffiliated scientists should contact the appropriate program (see Appendix VII) before submitting a proposal.

WHEN TO SUBMIT

Research proposals may be submitted at any time. Applicants should allow 6 to 9 months for review and processing. Proposals to be funded in a particular fiscal year (ending September 30) normally should be received no later than January of that year. Some programs set target dates for submission of proposals to allow time for their consideration by advisory committees, which meet periodically. These target dates are published in the *NSF Bulletin*. Inquiry about submission also may be made to the appropriate program office.

Every effort is made to reach a decision and inform the applicant promptly. Until a decision is announced, no information can be provided on the probability of support.

WHERE TO SUBMIT

Proposals should be addressed to the Central Processing Section, National Science Foundation, Washington, D.C. 20550. If copies of the proposal are mailed in more than one package, the number of packages should be marked on the outside of each package. Proposals must be sent prepaid, not collect. The acknowledgment of receipt of the proposal will contain a registry number. Later communications about the proposal should be addressed to the cognizant program officer and identified by the NSF registry number.

WHAT TO SUBMIT

Proposals should cover the points discussed in the following paragraphs insofar as they are applicable. To facilitate processing, proposals should be stapled in the upper left-hand corner, but otherwise unbound, single-spaced, with pages numbered at the bottom and a one-inch margin at the top. The original signed copy should be printed only on one side of each sheet. Additional copies may be printed on both sides. **Appendix VII indicates the required number of copies of proposals, including the original signed copy.** Any reprints, appendixes, or other materials to be considered with the proposal must be attached to the individual copies of the proposal. To avoid delay in the review process, the proposal should be complete at the time of submission.*

Since thousands of proposals are received each year, their review is facilitated when the contents are assembled in the following standard sequence: cover page, table of contents, project summary, project description, bibliography, biographical sketches, budget, current and pending support, appendixes. Material on facilities and special considerations affecting the research should be included in appendixes.

Cover Page

The desired format for the cover page is given in Appendix I.

If there have been prior discussions with a particular NSF program and the proposal is intended for its consideration, complete the box "For Consideration by NSF Organization Unit."

The title of the proposed research project should be brief, scientifically valid, intelligible to a scientifically literate reader, and suitable for use in the public press. NSF may edit the title of a project before making an award.

The proposed duration for which support is requested should be consistent with the nature and complexity of the proposed research. Research grants may be awarded for periods up to 5 years.

Specification of a desired starting date for the research is important and helpful to NSF staff. However, the institution may not make charges to a grant for costs associated with the project that were incurred before the effective date designated in the grant letter. Should unusual situations, such as long lead time on procurements, create problems regarding the proposed effective date, the investigator should consult the institution's business office for advice and inform the NSF program office to which the proposal has been assigned.

Small businesses should check the small-business box on the cover page. A small business must be organized for profit, independently owned and operated (not a subsidiary of or controlled by a large firm), have no more than 500 employees, and not be dominant in its field (from Title 13, Code of Federal Regulations, Part 121 as amended). The box should be checked also when the proposal involves a cooperative effort between an academic institution and a small business.

Research proposals should be cleared through the institutional officer having responsibility for Federal business relations to ensure conformance with local and Federal administrative procedures. One copy of the proposal must be signed by the principal investigator(s) and an official authorized to commit the institution in business and financial affairs. Proposing institutions may have additional signature requirements. Other copies should record the names and titles of those who have signed the original. Proposals are incomplete if endorsement signatures are omitted.

Table of Contents

The table of contents, which is required, should show the location of each section of the proposals as well as major subdivisions of the project description, such as the summary of previous work, statement of proposed research, and methods and procedures to be used. The major sections are: Table of Contents, Project Summary, Project Description, Bibliography, Biographical Sketches, Budget, Current and Pending Support, and Appendixes.

Project Summary

A 200-word summary of the proposed research, suitable for publication and using the format of Appendix II, is required. If a grant is awarded, the summary, edited if necessary, will be sent to the Smithsonian Science Information Exchange and made available to the public. The summary should include a statement of the research objectives, scientific methods to be employed, and the significance of the proposed research to the advancement of scientific knowledge. It should be informative to other scientists in the same or related fields and, insofar as possible, understandable by a scientifically literate reader.

Project Description

The main body of the proposal should be a detailed statement of the work to be undertaken and should include: objectives and expected significance; relation to the present state of knowledge in the field, to previous work done on this project, and to related work in progress elsewhere. The statement should outline the general plan of work, including the broad design of experiments to be undertaken and an adequate description of experimental methods and procedures. Any substantial collaboration with individuals not referred to in the budget should be described and documented with a letter from each collaborator.

---

*Institutions applying for the first time, or which have not received an NSF award withing the preceding 2 years, commerical organizations, and nonprofit, nonacademic institutions should refer to the *NSF Grant Policy Manual* for instructions on specific information required.

Proposals for equipment normally compete with proposals for regular research projects. Therefore, each potential major user should describe the research project(s) for which the equipment will be used. The descriptions should be succinct, not necessarily as detailed as in a regular research grant application, and should emphasize the intrinsic scientific merit of the research and the importance of the equipment to it. A briefer summary will suffice for auxiliary users.

Brevity will facilitate effective review. The project description normally should not exceed 15 single-spaced pages. Somewhat greater length may be appropriate for multiple-investigator proposals. Reviewers will be made aware of this norm.

Bibliography

A bibliography of pertinent literature is required.

Biographical Sketches

A short biographical sketch of each senior scientist should be included and a list of each investigator's publications during the past 5 years, including those in press. Equipment proposals should include a brief biographical sketch and a list of publications for each user.

For the personnel categories listed below (see Appendix III for definitions), the proposal should include information on exceptional qualifications of these individuals that merit consideration in the evaluation of the proposal.

- Postdoctoral associates
- Other professionals
- Graduate students (research assistants)*
- Secretarial, clerical
- Technical, shop, other

Budget

Unless a particular program brochure provides otherwise, each proposal must contain a budget for each year of support requested and a cumulative budget for the full term of requested NSF support. (The prescribed budget format may be reproduced from Appendix III or Exhibit II-2, *NSF Grant Policy Manual.*) Contributions to the proposed research from other Federal and non-Federal sources (other than from the submitting institution itself) should be shown under "Remarks." The proposal may request funds under any of the categories listed so long as the item is considered necessary to perform the research. Normally equipment grants do not provide support for personnel, overhead, installation, or operating costs. If funds for such costs are considered essential to the success of the research to be performed with the requested equipment, the proposal should provide detailed justification. The Foundation requires cost sharing in accordance with policies set forth in the *NSF Grant Policy Manual.*

SALARIES AND WAGES

As a general policy NSF recognizes that salaries of faculty members and other personnel associated directly with the research constitute appropriate direct costs in proportion to the effort devoted to the research.

The names of the principal investigator(s), faculty, and other senior associates and the estimated number of academic-year, summer, or calendar-year man-months for which NSF funding is requested should be listed. For postdoctoral associates and other professionals, list each position with the number of full-time-equivalent man-months and rate of pay (hourly, monthly, or annual) indicated. For graduate and undergraduate students, secretarial, clerical, technical, etc., only the total number of persons and total amount of salaries per year in each category are required. Salaries requested must be consistent with the institution's regular practices.

The submitting institution may request that salary data on senior personnel not be released to persons outside the Government. In this case, the item for senior personnel salaries in the formal proposal may appear as a single figure and the man-months represented by that amount omitted. If this option is exercised, however, senior personnel salaries and man-months must be itemized in a separate statement, two copies of which should accompany the proposal (see "Proposal as Public Record"). This statement must include all of the information requested in the Summary Proposal Budget for each person involved. NSF will not forward the detailed information to reviewers and will hold it privileged to the extent permitted by law. The information on senior personnel salaries will be used as the basis for determining the salary amounts shown in the grant budget.

NSF regards research as one of the normal functions of faculty members at institution of higher education. Compensation for time normally spent on research within the term of appointment is deemed to be included within the faculty member's regular institutional salary. Grant funds may not be used to augment the total salary or rate of salary of faculty members during the period covered by the term of faculty appointment or to reimburse faculty members for consulting or other time in addition to a regular full-time institutional salary covering the same general period of employment.

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*Note. Research associates and research assistants are not to be designated as "NSF Fellows" or other title of similar import. This designation is reserved for holders of Foundation fellowship awards.

Summer salary for faculty members on academic-year appointments will not be funded for more than two-ninths of their regular academic-year salary. This total includes summer salary received from all NSF-funded grants. Exceptions to this limitation are permitted only in unusual cases, which must be fully justified in the proposal.

These same principles apply to other types of organizations, such as research institutes. Since their employment periods are usually annual, however, there is seldom a possibility of "summer salary" in an NSF grant.

A special question sometimes arises when an independent institute or laboratory proposes to employ college or university faculty members on a part-time basis. In such cases the general intent of the policies above shall apply, so that an individual's total income will not be augmented in ways that would be possible under a grant to an academic institution.

RESEARCH ASSISTANTSHIPS

The budget may request funds for support of graduate students (research assistants) to help carry out the proposed research. Compensation classified as salary payments should be requested in the salaries and wages category. Any funds requested for tuition remission should be listed separately under "All Other Direct Costs."

FRINGE BENEFITS

If the grantee's usual accounting practices provide that its contributions to employee "benefits" (social security, retirement, etc.) be treated as direct costs, NSF grant funds may be requested to defray such expenses as a direct cost.

EQUIPMENT

NSF defines equipment as an item of property that has an acquisition cost of $300 or more and an expected service life of 1 or more years. Items of needed equipment should be individually listed by description and estimated cost, including tax, and adequately justified. Allowable items ordinarily will be limited to scientific equipment and apparatus that are not already available for the conduct of the work. General-purpose office equipment normally will not be considered eligible for support.

The purchase of each item of equipment costing $1,000 or more requires prior written approval by NSF. This approval may be indicated on the grant budget or in subsequent correspondence. If a proposal includes the purchase or lease of special-purpose equipment having a unit acquisition cost above $10,000, the authorized organizational representative must certify that the equipment (a) is essential and not reasonably available and accessible to the project and (b) if funded by NSF, will be subject to reasonable inventory controls, maintenance procedures, and organizational policies that will enhance its multiple or shared use on other projects, if the other use will not interfere with the work on the project for which the equipment is being acquired. Because of the lead time involved, it may not be practical for an institution to make this certification when it submits the proposal. In such cases, NSF will accept a statement to that effect in the proposal with the understanding that the certification will be supplied before a grant is made.

MATERIALS AND SUPPLIES

The budget should indicate in general terms the types of required expendable materials and supplies with their estimated costs. The breakdown should be more detailed when the cost is substantial.

DOMESTIC TRAVEL

The type and extent of travel and its relation to the research should be briefly specified. Funds may be requested for field work, attendance at meetings and conferences, other travel associated with the research, and subsistence. In order to qualify for support, however, attendance at meetings or conferences must enhance the investigator's capability to perform the research, plan extensions of it, or disseminate its results. Consultants' travel costs also may be requested.

FOREIGN TRAVEL

Travel in the United States and its possessions, Puerto Rico, and Canada is considered domestic travel; all other is foreign. The proposal should include relevant information (including countries to be visited) and justification for any foreign travel planned in connection with the research. Each foreign trip not specifically included and authorized in the grant budget must receive advance written approval by the Foundation if grant funds are to be used.

Allowances for air travel normally will not exceed the cost of round-trip, jet-economy air accommodations. Persons traveling under NSF grants or contracts must travel by U.S. flag carriers, if available, unless:

1. The traveler, while enroute, has to wait 6 hours or more for an available U.S. carrier.
2. The flight by a U.S. flag carrier takes 12 or more hours longer than a foreign carrier.

Travel support for dependents may be requested under the following conditions:

1. The investigator is a key person who is essential to the research on a full-time basis.
2. The investigator's residence away from home and in a foreign country for a continuous period of 6 months or more is essential to the effective performance of the project.
3. The payment of dependent's travel allowance is consistent with the policies of the institution administering the grant.

The Foundation also provides limited support for foreign travel to international scientific meetings through competitively granted funds that are budgeted separately. (See Section IV for additional information.)

PUBLICATION COSTS/PAGE CHARGES

The budget may request funds for the costs of preparing and publishing the results of research conducted under the grant, including costs of reports, reprints, page charges or other journal costs (except cost for prior or early publication), and necessary illustrations.

COMPUTER (ADPE) SERVICES

The cost of computer services, including computer-based retrieval of scientific and technical information, may be requested. A justification based on the established computer-service rates at the proposing institution should be included. The budget also may request costs, which must be shown to be reasonable, for leasing automatic data-service rates at the proposing institution should be included. The budget also may request costs, which must be shown to be reasonable, for leasing automatic data-processing equipment (ADPE). The purchase of computers or associated hardware should be requested as items of equipment.

CONSULTANT SERVICES

Anticipated consultant services should be justified and information furnished on each individual's expertise, primary organizational affiliation, daily compensation rate, and number of days of expected service. Consultants' travel costs should be listed separately under travel in the budget. Payment for a consultant's services may not exceed the daily equivalent of the maximum rate paid a U.S. Government GS-18 ($193).

PARTICIPANT SUPPORT COSTS

Normally budgets do not include costs for participant support. The use of this category in proposals for support of conferences, symposia, or workshops is discussed in Section IV.

OTHER DIRECT COSTS

The budget should itemize other anticipated direct costs not included under the headings above. Examples are: aircraft rental, space rental at research establishments away from the grantee institution, minor building alterations, payments to human subjects, service charges, and construction of equipment or systems not available off-the-shelf. Reference books and periodicals may be charged to the grant only if they specifically relate to the research project.

Subcontracts should be disclosed in the proposal so that the grant instrument will contain their prior approval. There should be a completed budget, in the prescribed NSF format, for each subcontract with signatures of officials of the subcontracting organization. The total amount of each subcontract should appear as a line item under "All Other Direct Costs" of the master budget for the project. None of the research effort under an NSF grant may be contracted or transferred to another organization without prior written approval by NSF.

INDIRECT COSTS

The indirect cost rate negotiated by the institution with the cognizant Federal negotiating agency must be used in computing indirect costs for a research proposal. Determination of the appropriate indirect cost rate depends on a combination of factors including, but not limited to, physical location of the work. If your institution has no established indirect cost rate, it should either consult the Foundation, which will establish liaison with the cognizant Federal negotiating agency, or submit separately an indirect cost rate proposal to the NSF Division of Grants and Contracts, Attention: Indirect Costs, Washington, D.C. 20550. Rate-proposal data vary according to the type of proposing organization. An institution may obtain appropriate guidelines for submitting rate proposals from the Division of Grants and Contracts (telephone: (202) 357-7547).

It is NSF policy that grantees are entitled to full reimbursement from grant funds for indirect costs allocable to the NSF share of allowable direct costs of a project except for grants:

- to individuals;
- solely for the support of travel, equipment, construction of facilities, or doctoral dissertations;
- for participant support costs (see "Conferences, Symposia, and Research Workshops"); and
- foreign grantees.

Current and Pending Support

Appendix IV gives the format for reporting current and pending support for proposals, as well as for each subsequent funding request in the case of continuing grants. Besides the proposed project, all current research to which the principal investigator(s) and other senior personnel have committed a portion of their time must be listed, whether or not their salaries are included in the budgets of the various projects. The number of man-months or percentage of effort to be devoted to the projects should be stated regardless of source of support. Similar information must be provided too for all proposals that are being considered by or will be submitted soon to other possible sponsors, including NSF.

If the project now submitted has been funded previously by a source other than NSF, the information requested in the paragraph above should be furnished for the immediately antecedent funding period. This information will help the Foundation analyze shifts in research support.

If the proposal is being submitted to other possible sponsors, all of them should be listed. Concurrent submission of a proposal to other organizations will not prejudice its review by the Foundation.

Appendixes

FACILITIES

An appendix to the proposal should describe available facilities and major items of equipment to be used in the research.

Proposals requesting multiple-use equipment should describe comparable equipment that is already at the proposing institution and explain why it cannot be used. The degree of utilization also should be discussed. Equipment to be purchased, modified, or constructed should be sufficiently described to allow comparison of its capabilities with the needs of the research. Whenever possible, the proposal should specify the manufacturer and model number.

In equipment proposals, usually only a single instrument or system will be considered. If more than one is requested, the proposal must arrange them in order of priority and give explanations and scientific justification for each. The institution's contribution to the cost of equipment or its willingness to support the cost of construction or renovation of needed facilities may be considered by NSF as an indication of the institution's commitment to the project.

Equipment proposals should also describe arrangements for maintenance and operation, including:

1. The name and biographical sketch of the person(s) who will have overall responsibility for maintenance and operation and a brief statement of his or her qualifications for this responsibility, if the sketch does not make them obvious.
2. A description of the physical facility where the equipment will be located. Floor plans or other data may be included if appropriate.
3. Annual budget for operation and maintenance of the proposed equipment, indicating source of funds.
4. A brief description of other research-support services available, particularly related equipment, and the annual budget for their operation, maintenance, and administration.

If any of the project is to be performed away from campus or headquarters, this should be explained fully. Collaborative arrangements should be documented.

SPECIAL CONSIDERATIONS

Several situations require that special information and supporting documents be included in the proposal, normally in an appendix, before funding can be approved. Among these are the following, some mandated by Federal law:

1. Research that has an actual or potential impact on the environment.
2. Research in foreign countries. Some governments require nonresidents to obtain official approval to do research within their borders. Investigators are responsible for obtaining the required authorizations and for advising NSF that they have been obtained or requested.

Advance coordination should minimize disruption of the research.

3. Research in the Antarctic.
4. Research at a registered historic or cultural property.
5. Research involving the use of recombinant DNA molecules generated *in vitro*.
6. Research involving the use of human subjects, hazardous materials, laboratory animals, marine mammals, or endangered species.

In addition, the proposal should alert NSF officials to unusual circumstances that require special treatment, including, for example, proprietary or other privileged information in the proposal, matters affecting individual privacy, or possible national security implications.

The proposal should address each special consideration that is relevant to the project and provide information on the status of any special permissions, clearances, or certifications. Assessment of environmental impact should be included where appropriate.

Specific guidance on the need for additional documentation may be obtained from the institution's research administration office or the *NSF Grant Policy Manual*.

ii. PROPOSAL PROCESSING AND EVALUATION

Research proposals are received by the Central Processing Section, acknowledged, and assigned to the appropriate NSF program for evaluation. Those not clearly assignable are referred to appropriate program personnel and occasionally to a directorate office for determination. All proposals are reviewed carefully by a scientist serving as an NSF program officer and usually by 3 to 10 other scientists who are expert in the particular field represented by the proposal. Some program officers obtain further comment from assembled advisory committees before recommending final action on proposals. Recommendations for awards are further reviewed by senior NSF staff to assure that actions being taken are in accordance with established Foundation policy. When decisions are announced, verbatim copies of reviews, excluding the identity of the reviewer, are available to the principal investigator/project director.

The following criteria or factors are considered in the evaluation of research projects.*

Criteria relating to creative performance of research—the technical ability of the performer and of adequacy of the institutional base:

1. Potential for future accomplishment by the scientist based on the recent record of performance, experience, and training;
2. Demonstrated awareness by the scientist of previous and alternative approaches to the problem;
3. Adequacy of available or obtainable instrumentation, preparatory data, and technical support for the scientist.

Criteria relating to the internal structure of science itself:

4. Probability that the research will lead to important discoveries or significant conceptual generalizations within its field of science and, in most favorable cases, extending to other fields as well;
5. Probability that the research will lead to significant improvements or innovations in investigative methods within its own field and possibly in other fields of science.

For scientific research support, the emphasis is overwhelmingly on Criteria 1-5.

Criteria relating to utility or relevance to national objectives:

6. Probability that the research can serve as the basis for new inventions or improved technology;
7. Probability that the research will contribute substantially to technology assessment—i.e., to assessing or predicting the direct and indirect, intended and unintended effects of existing or proposed technologies;
8. Identification of an immediate programmatic context for, and user(s) of, the anticipated research results;
9. Probability that the research will assist in solving societal problems, in improving the knowledge base for national policies requiring science and technology, or in furthering the interests of international cooperation in science.

Criteria relating to future and long-term scientific potential of the United States:

10. Probability that the research will positively influence the capabilities, interests, and careers of participating graduate students, postdoctoral associates, or other junior researcher/workers;
11. Probability that the research will contribute to a tradition of excellence in the field;
12. Anticipated effect upon the instructional structure of U.S. science;
13. Probability that funds allocated for the research will aid the effort to avoid undue concentration in any region of the Nation.

Because none of these considerations is susceptible to precise quantification, or even in most cases to unambiguous rank ordering, it would be more accurately descriptive to speak not of "criteria" but rather of "factors considered." Moreover, very different relative weights must be attached to the different factors in the case of different agency objectives or programs. In the evaluation of unsolicited proposals for the support of basic research projects, the overwhelming emphasis is on intrinsic scientific merit (Criteria 4 and 5). The expectation of competent performance (Criteria 1, 2, and 3) always must be present. Criteria 10, 11, 12, and 13 also are considered with respect to each proposal. On the other hand, Criterion 8 relates only to applied research projects. Criteria 6 and 7 may be particularly applicable to applied science and engineering proposals.

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*Taken from the National Science Board policy statement, NSB 79-100, Criteria for the Selection of Research Projects by the National Science Foundation.

The foregoing standards apply both to individual research proposals and to the separate parts of group proposals. The individual parts must be of adequate quality in their own right or of sufficient significance to achievement of the overall goals that the project could not be carried out without them. Only those parts of a group proposal that meet NSF's standards of award will be funded.

In the evaluation of proposals for specialized research equipment, the scientific merit of the research and the likelihood that the equipment will improve the quality or scope of the research (Criteria 4 and 5) are important; so too are Criteria 1 and 2, which bear on the ability of the grantee to use the equipment fully, effectively, and efficiently.

III. DECLINATIONS AND WITHDRAWAL

An applicant whose proposal for NSF grant support has been declined may request and receive from the cognizant program officer the reasons for the action. In addition, the principal investigator/project director may obtain verbatim copies of reviews, though not the names of the reviewers. If the program officer's explanation of the declination does not satisfy the principal investigator, he may request the cognizant NSF Assistant Director to reconsider the action to determine whether the proposal received a fair and impartial evaluation. The request for reconsideration must be received within 180 days of the date of the declination letter. (See NSF Important Notice 61, Sec. 235, *Grant Policy Manual.*)

A declined proposal may be resubmitted for consideration only after it has undergone revision. The Foundation will treat the revised proposal as a new one under the usual review and evaluation procedures.

An applicant may withdraw a proposal at any time before a final decision is made. Normally NSF does not return the proposals to the applicant. The Foundation retains a file copy.

IV. GRANTS FOR OTHER PURPOSES CONNECTED WITH RESEARCH

SPECIALIZED FACILITIES

From time to time the Foundation provides assistance for the acquisition of facilities of a specialized nature. Examples include nuclear accelarators, oceanographic research vessels, major controlled-environment facilities, and specialized biological and social science facilities. Preliminary inquiry should be made before submission of a formal proposal.

FOREIGN TRAVEL

The Foundation supports international travel to assist scientists going abroad for the following purposes:

1. Attending international scientific congresses and meetings.
2. Obtaining or exchanging information in the areas of scientific research, science information, or international scientific programs and associated activities.
3. Cooperating in international scientific activities.

NSF treats as international travel all travel outside the United States and its possessions, Puerto Rico, and Canada. U.S. flag carriers must be used when such service is available (see p. 6)

International travel support may be awarded to scientific societies or other institutions in the United States for subsequent award to individual scientists for partial travel support to attend international scientific meetings. When such block awards are made, no individual travel request will be accepted for the same meeting. Federal employees are cautioned against acting as agents for organizations in submitting proposals for such grants.

Foreign travel directly related to a research project supported by NSF should be funded out of the project grant (see p. 6).

Application forms and further information may be obtained from the Foundation's Division of International Programs.

CONFERENCES, SYMPOSIA, AND RESEARCH WORKSHOPS

The Foundation supports conferences, symposia, and research workshops in special areas of science that bring leading scientists together to discuss recent research findings or to expose other researchers or advanced graduate students to new research techniques. The Foundation encourages the convening in the United States of major international scientific conferences and assemblies of international scientific unions. Conferences will be supported only if equivalent results cannot be obtained at regular meetings of professional societies. Although requests for support of conferences, symposia, and research workshops ordinarily originate with educational institutions or scientific societies, they also may come from other groups. Concomitant support by several Federal agencies or private organizations is permissible. Since the proceedings of such meetings interest a wider group than those in attendance and normally should be published in scientific journals, requests for support may include publication costs. Requests for support generally should be made at least a year in advance of the scheduled date.

A proposal for support of a conference, symposium, or research workshop should include:

- A project summary of 200 words or less indicating the objectives of the program.
- A full statement of the need for such a gathering and the list of topics.
- Recent meetings on the same subject, including dates and places.
- Names of the chairman and members of organizing committees.
- A list of proposed participants, information on the location and probable date(s) of the meeting, and the method of announcement or invitation.
- An estimated total budget for the conference together with an itemized statement of the amount of support requested from the Foun-

dation. The budget may include participant support for transportation, per diem costs and stipends (when appropriate), and other conference-related costs. Indirect costs are subject to negotiation with the grantee.

- Support requested or available from other Federal agencies and other contributors.

On completion of the conference, the grantee should send to NSF a brief report on the scientific highlights of the meeting (see "Grant Reports," p. 18).

DOCTORAL DISSERTATION RESEARCH

The Foundation awards grants in support of doctoral dissertation research in the following sciences: atmospheric, earth, ocean, environmental biology, behavioral, neural, and social. Further information can be obtained from the cognizant program office.

ENGINEERING RESEARCH INITIATION

The Foundation awards research-initiation grants to engineering faculty members holding full-time academic appointments as assistant or associate professor. Brochures are distributed annually and a single competition held.

SMALL-COLLEGE FACULTY OPPORTUNITY AWARDS

A faculty member at an institution with limited research opportunities may arrange to work with an investigator at another institution who holds or is applying for an NSF research grant. The grantee may request supplemental funding to cover the additional costs. If supplemental funds are required, a brief proposal, including a description of the proposed research, budget, and biographical sketch, should be submitted to NSF.

INFORMATION SCIENCE

NSF support is available for investigations on both fundamental and applied problems in information science. NSF also awards grants for research on the characteristics of scientific and technical communication systems. For further information and relevant program guidelines, contact the Division of Information Science and Technology.

OTHER RESEARCH SUPPORT ACTIVITIES

The *Guide to Program* contains descriptions and further information on other NSF programs.

V. THE AWARD AND CONTINUED GRANT SUPPORT

GRANT AWARD

The Foundation awards two types of grants:

(1) *Standard Grants:* in which NSF agrees to support a specified level of effort for a specified period of time with no statement of NSF intent to provide additional future support. Standard grants are fully funded in a single action.

(2) *Continuing Grants:* in which NSF agrees to support a specified level of effort for a specified period of time with a statement of intent to provide additional support of the project, provided funds are available and the results achieved warrant further support. Funding normally will be in one-year increments. The grant letter will state the dollar amount for each committed year. If the annual funding level exceeds $200,000, the grant letter may state an approximate support level with the provision that the actual level will be negotiated annually.

Notification of a grant award is by letter signed by the Foundation's Grants Officer, addressed to the institution to which the grant is made. Copies are included for the principal investigator and the institution's business office.

The grant period begins on the effective date specified in the grant letter or, in its absence, the date of the grant letter and runs until the expiration date indicated. The expiration date usually includes a 6-month "grade period" for which no funds are provided. Expenditures incurred before the effective date of the grant may not be charged against the grant. Expenditures after the scheduled expiration date of the grant may be made only to honor documented commitments made before the expiration date.

REQUESTS FOR RENEWAL OF SUPPORT

Proposals for renewal of a standard grant compete with all other pending proposals and should be submitted 6-9 months before additional funding is required. In preparing a renewal proposal, applicants should assume that reviewers will not have access to the previous proposals or progress reports. In addition to the material discussed in Section I, the renewal proposal should include:

1. A summary of progress to date and its relation to the proposed work.
2. A statement, by categories in the existing grant budget, of expenditures to the date of preparation of the renewal proposal, and of commitments and estimated expenditures to the requested effective date of the renewal grant. If commitments exist or are anticipated that will require the expenditure of any residual funds after the renewal date, they should be explained.
3. A proposed budget for the ensuing period.

For continuing grants, additional funding beyond the approved full term will require competitive review of a new proposal.

Incremental funding for continuing grants within the approved term is based on Foundation staff review of progress reports and proposed budgets and does not require submission of a new proposal. For each increment, two copies of an endorsed request, addressed to the cognizant program office, must be received by the Foundation at least 4 months before the end of the period currently being funded. Requests need only include:

1. A brief summary of scientific progress.
2. A statement of funds estimated to remain unobligated at the end of the period for which NSF currently is providing support; the amount to be carried forward (up to 10 percent of the amount of the current increment); and the residual amount in excess of 10 percent. Only with NSF approval based on adequate justification can amounts in excess of 10 percent of the current increment be carried forward as an addition to the next increment.
3. Three copies of a proposed budget for the ensuing year in the NSF format (Appendix III). (Indicate on line P any residual amount *in excess* of 10 percent of the current increment.)
4. Current information about other research support of senior personnel (see p. 7 and Appendix IV).

5. Updated Institutional Biohazard Committee and Human Subjects Certifications.

NO-COST EXTENSIONS

If additional time beyond the established expiration date of a grant is required to assure adequate completion of the original scope of work within the funds already granted, a no-cost extension may be requested. Normally NSF will authorize no-cost extensions only in the final year, and no single extension may exceed 12 months. For continuing grants, both the interim and final expiration dates may be extended; but the total extension period is limited to 18 months, of which no more than 6 months of the extra time will be permitted before the end of the final support period. Only in exceptional cases will the Foundation approve more than one extension.

Two copies of a request for a no-cost extension, signed by the principal investigator and the authorized organizational representative, must be received by the cognizant program office at least 45 days before the current expiration date of the grant award. The request must fully explain the need for the extension and include an estimate of the unobligated funds remaining and a plan for their use. This plan must coincide with the original or amended objectives of the project. That unobligated funds remain at the expiration of the award is not in itself sufficient justification for an extension.

An approved no-cost extension will be in the form of a formal amendment to the grant specifying a new expiration date.

VI. GRANT ADMINISTRATION HIGHLIGHTS

The administration research grants is governed by the conditions of the grant instrument. The following information on grant administration deals with questions that investigators often raise. The *NSF Grant Policy Manual* sets forth these and other administrative requirements.

Primary responsibility for general supervision of all grant activities rests with the grantee institution. The principal investigator is responsible for the conduct of a scientific work and the publication of its results and is expected to provide technical leadership to the project whether or not any salary is provided from grant funds.

NSF encourages grantees and principal investigators to seek its advice on administrative problems that may arise. Such advice does not imply an assumption of responsibility by the Foundation for final decisions.

INSTITUTIONS APPLYING FOR THE FIRST TIME

Grants for Federal financial assistance are subject to certain general requirements, such as compliance with the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, and other laws and regulations prohibiting unlawful discrimination; patent and copyright requirements; cost sharing; the use of U.S. flag carriers for international travel; and the use of foreign currency as appropriate to accomplish the objectives of the project. Organizations that have not previously received an NSF grant should, at the time of application, contact the Division of Grants and Contracts for instructions on the submission of data on organization an management.

ADHERENCE TO ORIGINAL RESEARCH OBJECTIVES

The principal investigator should feel free to pursue important leads that may arise during the conduct of the research. NSF support will not be jeopardized for the remainder of the grant period if the principal investigator discontinues or materially modifies the originally planned line of inquiry in favor of one that appears to have more scientific promise. NSF must give prior approval, however, when a modification would result in a major deviation from the original research objective or would include research activities specifically excluded from support when the award was negotiated.

ADHERENCE TO ORIGINAL BUDGET ESTIMATES

The grant instrument includes or refers to a budget that lists the items for which funds are provided. While the principal investigator has reasonable flexibility to alter the direction of research when changes seem scientifically advantageous, the grantee institution must consider the effect of any budget reallocations on the indirect cost portions of the budget and must observe the conditions prescribed by the award. Of particular interest to principal investigators are the following conditions that require specific, written, prior approval by the Foundation or the grantee institution's prior approval system for the costs to be reallocated within a previously approved grant budget.

Type of Expenditures	**Prior Approval Required**
1. Alterations and renovations	
a. Under $1,000	OPAS*
b. $1,000 or more	Grants officer
2. Capital expenditures for land, buildings, or repairs	Grants officer
3. Contractual (third party) costs	Grants officer
4. Equipment	
a. Special purpose: $1,000 or more	Program officer
b. General purpose	Grants officer
c. Cumulative expenditures that exceed budgeted amount by more than 25%	OPAS*
5. News release costs	Program officer
6. Participant support costs: transfer of funds to other categories of expense	Program officer
7. Pre-award costs	Grants Officer

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* Organizational Prior Approval System (see *NSF Grant Policy Manual*, Sec. 613).

8. Production or distribution of books, films, etc.	Grants officer
9. Rental or lease of facilities	Grants officer
10. Travel	
a. Each foreign trip and its costs	Program officer
b. Cumulative domestic travel expenditures that exceed budgeted amount by $500 or 25%, whichever is greater	OPAS*
c. Dependent foreign travel	Program officer

When a budget change requires NSF approval, two copies of a request, signed by the principal investigator and by the grantee institution's authorized official, should be sent to the cognizant NSF office. The request should clearly state which budget items are to be changed and by what amounts and should explain the reasons for the changes.

CHANGES IN PERSONNEL

Written Foundation approval is required for any permanent change in senior personnel or for any temporary change in excess of 3 months, such as an investigator taking sabbatical leave. Further, NSF must be informed when it appears that a principal investigator or other senior personnel will devote substantially less effort to the work than anticipated in the approved proposal. Support from group grants for senior personnel not specifically included in the grant budget or in a subgroup under one of the approved investigators requires prior written approval, which is based on review of a research proposal from the investigator to be included.

TRANSFER OF PRINCIPAL INVESTIGATOR

The Foundation does not transfer grants from one institution to another. If a principal investigator changes organizational affiliation, a new proposal may be initiated through the new institution. The original grantee institution may terminate the grant or, when appropriate, propose a substitute principal investigator to continue the research. NSF encourages the principal investigator and the appropriate representatives of the grantee institution or the new institution to consult with the cognizant program officer if such changes are anticipated.

EQUIPMENT

Title to equipment purchased or fabricated by an academic institution or other nonprofit organization with NSF grant funds normally vests in the grantee institution. Special situations may require that title be vested in the Government or that NSF reserve the right to require the grantee to transfer title to the Government or a third party on expiration of the grant. Title to equipment acquired through an NSF grant by a small business or other commercial firm normally will vest in the Government. When title to specialized research equipment purchased with grant funds vests in the grantee institution and the principal investigator transfers to another nonprofit institution, NSF may encourage transfer of the equipment to the new institution provided it is not required at the institution holding title, the cost of transfer is not excessive, and the principal investigator continues the research at the new location.

SUBCONTRACTS

If a subcontract becomes necessary after a grant has been made, the grantee must submit for NSF approval the proposed performance statement and budget, a statement indicating the basis for selection of the contractor, and a justification of the proposed arrangement. The request must be signed by the principal investigator and endorsed by the authorized institutional official.

EXCESS GOVERNMENT PROPERTY

As a means of providing additional support and conserving supply and equipment funds, the Foundation may sponsor the transfer of a limited quantity of excess Government property to an NSF grantee. To receive information concerning the availability of property, an eligible grantee should request in writing that the Project Property Section of the Foundation make arrangements to place the grantee on the General Services Administration's mailing list for information on the availability of property. Before transfer of excess Government property can be authorized, justification must be provided to the Foundation by the grantee that the property will further the objectives of an active NSF grant. (See Important Notice 58, Exhibit VII-3, *NSF Grant Policy Manual.*)

TERMINATION OF GRANTS

Foundation grants may be terminated for cause in accordance with the procedures contained in the Grant General Conditions. Grants also may be terminated by mutual agreement. Termination by mutual agreement shall not affect any financial commitment of grant funds that, in the judgment of the Foundation and the grantee, had become firm before the effective date of the termination.

GRANT REPORTS

ANNUAL PROGRESS REPORTS

For multi-year grants, principal investigators are required to submit a technical progress report to the cognizant NSF program officer annually. The report should briefly summarize activity during the past year, identify any significant scientific developments, and describe any problems encountered. Two reprints of each publication should be provided as soon as they are available.

FINAL REPORTS

Within 90 days after the expiration of a grant, the grantee is required to submit final expenditure information and a Final Project Report (NSF Form 98A). (See addendum). Final expenditure information information is supplied by grantees in the quarterly Federal Cash Transactions Report (SF 272). The NSF version of this report is a computer listing, furnished by the Foundation, listing all NSF grants at the institution. Instructions for completing this report will be found in the *NSF Grant Policy Manual.* NSF extracts all the fiscal information needed to close out awards from the Federal Cash Transactions Report and does not require grantees to submit a separate Financial Status Report (SF 269) for each completed award.

The Final Project Report, which includes the items listed in Part III, contains the technical information needed by the Foundation for purposes of program management and informing the public about the results of research it supports. A copy of the form and the associated instructions are attached in Appendix VI.

OTHER REPORTS

Some NSF awards may require unique reports or other end products in addition to those described above. In these cases, special provisions will be included in the award instrument.

The cognizant NSF program officer should be informed of research results of unusual interest whenever they become available.

ACKNOWLEDGMENT OF SUPPORT AND DISCLAIMER

Any publication based on research activity supported by the Foundation must contain the following acknowledgment: "This material is based upon work supported by the National Science Foundation under Grant ______________." All materials, except scientific articles or papers published in scientific journals, also must contain the following statement: "Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the National Science Foundation."

PROPOSAL AS PUBLIC RECORD

A proposal that results in an NSF grant becomes part of the record of the transaction and will be available to the public on specific request. Information or material that the Foundation and the grantee mutually agree to be of a privileged nature will be held in confidence to the extent permitted by law, including the Freedom of Information Act (5 U.S.C. 552). Without assuming any liability for inadvertent disclosure, NSF will seek to limit dissemination of such information to its employees and, when necessary for evaluation of the proposal, to outside reviewers. Accordingly, any privileged information should be in a separate, accompanying statement bearing a legend similar to the following: "Following is (proprietary) (specify) information that (name of proposing organization) requests not be released to persons outside the Government, except for purposes of evaluation."

A proposal that does not result in an NSF grant will be retained by the Foundation but will be released to the public only with the consent of the proposer, or to the extent required by law.

INVENTIONS, SOFTWARE, AND COPYRIGHTS

Each Foundation grant in support of research is subject to a patent and invention clause. This clause governs, in a manner calculated to protect the public interest and the equities of the grantee, the disposition of inventions made or conceived under the grant. Generally, it provides that, whenever an invention is conceived or first actually reduced to practice by the grantee or its employees in the course of a research grant, the grantee must furnish the Foundation with complete information thereon. The Foundation will determine whether a patent application should be filed and the disposition of the invention and rights in any resulting application or patent.

Grants for support of data banks or the creation of computer software of wide usefulness are subject to conditions reserving to the Foundation and to the general public certain rights of access to these data.

The Foundation encourages the publication and distribution of the results of research performed under its grants. Generally, publication is in scientific journals or similar media. The Government retains the right to use published materials and unpublished technical reports resulting from the performance of work under an NSF grant. The Foundation may arrange for the dissemination of substantive technical reports through the National Technical Information Service (NTIS) of the Department of Commerce to assure adequate dissemination of new or significant scientific knowledge. NSF must give advance approval for commercial publication or distribution of papers, monographs, proceedings, films, or other works produced under its grants.

APPENDIX I PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION

Cover Page

FOR CONSIDERATION BY NSF ORGANIZATIONAL UNIT (Indicate the most specific unit known, i.e. program, division, etc.)	IS THIS PROPOSAL BEING SUBMITTED TO ANOTHER FEDERAL AGENCY? Yes ____ No ____ ; IF YES, LIST ACRONYM(S):
PROGRAM ANNOUNCEMENT/SOLICITATION NO.:	CLOSING DATE (IF ANY):

NAME OF SUBMITTING ORGANIZATION TO WHICH AWARD SHOULD BE MADE (INCLUDE BRANCH/CAMPUS/OTHER COMPONENTS)

ADDRESS OF ORGANIZATION (INCLUDE ZIP CODE)

TITLE OF PROPOSED PROJECT

REQUESTED AMOUNT	PROPOSED DURATION	DESIRED STARTING DATE
PI/PD DEPARTMENT	PI/PD ORGANIZATION	PI/PD PHONE NO.

PI/PD NAME	SOCIAL SECURITY NO.*	DATE OF HIGHEST DEGREE ACHIEVED	MALE*	FEMALE*
ADDITIONAL PI/PD & SIGNATURE				
ADDITIONAL PI/PD & SIGNATURE				
ADDITIONAL PI/PD & SIGNATURE				
ADDITIONAL PI/PD & SIGNATURE				

FOR RENEWAL OR CONTINUING AWARD REQUEST, LIST PREVIOUS AWARD NO.:	IF SUBMITTING ORGANIZATION IS A SMALL BUSINESS CONCERN, CHECK HERE ☐ (See CFR Title 13, Part 121 for Definitions)

* Submission of SSN and other personal data is voluntary and will not affect the organization's eligibility for an award. However, they are an integral part of the NSF information system and assist in processing proposals. SSN solicited under NSF Act of 1950, as amended.

CHECK APPROPRIATE BOX(ES) IF THIS PROPOSAL INCLUDES ANY OF THE ITEMS LISTED BELOW:

☐ Animal Welfare
☐ Endangered Species
☐ Historical Sites
☐ Human Subjects
☐ Marine Mammal Protection
☐ Pollution Control
☐ National Environmental Policy Act
☐ Research Involving Recombinant DNA Molecules
☐ Proprietary and Privileged Information

PRINCIPAL INVESTIGATOR/ PROJECT DIRECTOR	AUTHORIZED ORGANIZATIONAL REP.	OTHER ENDORSEMENT (optional)
NAME	NAME	NAME
SIGNATURE	SIGNATURE	SIGNATURE
TITLE	TITLE	TITLE
DATE	DATE	DATE

APPENDIX II

NOTICE OF RESEARCH PROJECT
SCIENCE INFORMATION EXCHANGE

SMITHSONIAN INSTITUTION

NATIONAL SCIENCE FOUNDATION
PROJECT SUMMARY

PROJECT NO. (Do not use this space)
NSF AWARD NO.

1. NAME OF INSTITUTION (INCLUDE BRANCH/CAMPUS & SCHOOL OR DIVISION)

2. MAILING ADDRESS

3. PRINCIPAL INVESTIGATOR AND FIELD OF SCIENCE/SPECIALTY

4. TITLE OF PROJECT

5. SUMMARY OF PROPOSED WORK (LIMIT TO 22 PICA OR 18 ELITE TYPEWRITTEN LINES)

FOR NSF USE ONLY

DIVISION (OFFICE) AND DIRECTORATE	PROGRAM	
SECTION	PROPOSAL NO.	F.Y.

FOR DGC USE ONLY

START AND END DATES	AMOUNT GRANTED

NSF FORM 4 (7-78)

1. Proposal Folder
2. Program Suspense
3. Division of Grants & Contracts
4. Science Information Exchange
5. Principal Investigator
6. Off. of Govt. & Pub. Progs.
7. Assistant Director

APPENNDIX III

SUMMARY PROPOSAL BUDGET

FOR NSF USE ONLY	
PROPOSAL NO.	
DURATION (MONTHS)	
PROPOSED	REVISED

ORGANIZATION AND ADDRESS

PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR

NSF USE	A. SENIOR PERSONNEL (LIST BY NAME; SHOW NUMBERS OF PEOPLE IN BRACKETS; SALARY AMOUNTS MAY BE LISTED ON SEPARATE SCHEDULE) GPM 205.1b	NSF FUNDED MAN MONTHS CAL.	NSF FUNDED MAN MONTHS ACAD.	NSF FUNDED MAN MONTHS SUMR.	FUNDS REQUESTED BY PROPOSER	FUNDS GRANTED BY NSF (IF DIFFERENT)
	1. P.I./P.D.				$	$
	2. CO P.I./P.D.				$	$
	3. CO P.I./P.D.				$	$
	4. CO P.I./P.D.				$	$
	5. CO P.I./P.D.				$	$
11115	6. ( ) ◄ SUBTOTALS A1 - A5 ►				$	$
	FACULTY AND OTHER SENIOR ASSOCIATES (ATTACH EXTRA SHEET IF NECESSARY)					
	7.				$	$
	8.				$	$
	9.				$	$
	10.				$	$
	11.				$	$
11117	12. ( ) ◄ SUBTOTALS A7 - A11 ►				$	$
	B. OTHER PERSONNEL (LIST NUMBERS IN BRACKETS)					
11141	1. ( ) POSTDOCTORAL ASSOCIATES				$	$
11149	2. ( ) OTHER PROFESSIONALS				$	$
11150	3. ( ) GRADUATE STUDENTS				$	$
11152	4. ( ) UNDERGRADUATE STUDENTS				$	$
11182	5. ( ) SECRETARIAL - CLERICAL				$	$
11183	6. ( ) TECHNICAL, SHOP, OTHER				$	$
	TOTAL SALARIES AND WAGES (A+B)				$	$
11200	C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				$	$
	TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A+B+C)				$	$
	D. EQUIPMENT (LIST ITEMS AND DOLLAR AMOUNTS FOR EACH ITEM)					
23181	TOTAL EQUIPMENT				$	$
	E. MATERIALS AND SUPPLIES					
32630					$	$
	F. DOMESTIC TRAVEL					
42111					$	$
	G. FOREIGN TRAVEL (LIST DESTINATION AND AMOUNT FOR EACH TRIP; GPM 731)					
42112					$	$

PAGE 1 OF 2 PAGES

SUMMARY PROPOSAL BUDGET

PROPOSAL NO.

52500	H. **PUBLICATION COSTS/PAGE CHARGES**	$	$
62315	I. **COMPUTER (ADPE) SERVICES**	$	$
	J. **CONSULTANT SERVICES** (IDENTIFY CONSULTANTS BY NAME AND AMOUNT; GPM 516)	▨	▨
		$	$
	K. **PARTICIPANT SUPPORT COSTS, IF ALLOWED BY PROGRAM GUIDE** (ITEMIZE) GPM 518 1. STIPENDS $ ______ 2. TRAVEL $ ______ 3. SUBSISTENCE $ ______ 4. OTHER - SPECIFY $ ______	▨	▨
	5. TOTAL PARTICIPANT COSTS (K1 + K2 + K3 + K4)	$	$
	L. **ALL OTHER DIRECT COSTS** (List items and dollar amounts. Details of subcontracts, including work statements and budget, should be explained in full in proposal.) $ ______ $ ______ $ ______ $ ______	▨	▨
65001	TOTAL OTHER DIRECT COSTS	$	$
	M. **TOTAL DIRECT COSTS** (A THROUGH L)	$	$
	N. **INDIRECT COSTS** (Specify rate(s) and base(s) for on/off campus activity. Where both are involved, identify itemized costs included in on/off campus bases in remarks.)	▨	▨
74100	TOTAL INDIRECT COSTS	$	$
	O. **TOTAL DIRECT AND INDIRECT COSTS** (M + N)	$	$
74500	P. **LESS RESIDUAL FUNDS** (If for further support of current project; GPM 252 and 253)	$	$
75000	Q. **AMOUNT OF THIS REQUEST** (O MINUS P)	$	$

REMARKS

NOTE: SIGNATURES REQUIRED ONLY FOR REVISED BUDGET (GPM 233). THIS IS REVISION NO.

SIGNATURE OF PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR	DATE OF SIGNATURE	TYPED OR PRINTED NAME AND TITLE
SIGNATURE OF AUTHORIZED ORGANIZATIONAL REPRESENTATIVE	DATE OF SIGNATURE	TYPED OR PRINTED NAME AND TITLE

FOR NSF USE ONLY

INDIRECT COST RATE VERIFICATION			PROGRAM OFFICER APPROVAL
Date Checked	Date of Rate Sheet	Signature	

Grant Number	Amend No.	Institution	Organization	Fund Acct.	Program	Object	

	Proposal Number	Dur.	Chg.	Award Date	Proposed Amount	Propsd. Dur.	

PAGE 2 OF 2 PAGES

SUMMARY PROPOSAL BUDGET EXPLANATORY REMARKS

The personnel categories listed in Part A of the summary are defined as follows:

A. *Senior Personnel*

1. *(Co) Principal Investigator(s)* are individual(s) so designated by the grantee institution.
2. *A Faculty Associate* (faculty member) is an individual—other than the Principal Investigator—who is considered by the performing institution to be a member of its faculty or who holds an appointment as a faculty member at another institution, and who will participate in the project being supported.

B. *Other personnel*

1. *A Postdoctoral Associate* is an individual who received a Ph.D., M.D., D.Sc., or equivalent degree less than 5 years ago, who is not a member of the faculty of the performing institution, and who is not reported under Senior Personnel above.
2. *Other Professional* is a person who may or may not hold a doctoral degree or its equivalent, who is considered professional and is not reported as a Principal Investigator, faculty associate, postdoctoral associate, or student. Examples of persons included in this category are doctoral associates not reported under B1 above, professional technicians, mathematicians, physicians, veterinarians, system experts, computer programmers, and design engineers.
3. *A Graduate Student* (Research assistant) is a is a part-time or full-time student working on the project in a research capacity who holds at least a bachelor's degree or its equivalent and is enrolled in a degree program leading to an advanced degree.
4. *An Undergraduate Student* is a student who is enrolled in a degree program (part-time or full-time) leading to a bachelor's degree.

5.&6. These include persons working on the project in a nonresearch capacity, such as secretaries, clerk-typists, draftsmen, animal caretakers, electricians, and custodial personnel, regardless of whether they hold a degree or are involved in degree work.

Any personnel category for which NSF funds are requested should indicate the number of different persons expected to receive some support from those funds, and, where called for on the budget format, the full-time equivalent (FTE) man-months to the nearest tenth.

APPENDIX IV

Current and Pending Support

The following information should be provided for each investigator and other senior personnel (see p. 7). Failure to provide this information may delay consideration of the proposal.

	A	B	C	D	E		F
	Supporting Agency	Project Title	Award Amount (or Annual Rate)	Period Covered By Award	Man-Months Or % of Effort Committed To The Project		Location Where Research Is/Will Be Performed
					ACAD.	SUMM.	
I. (Name of Principal Investigator)							
A. *Current Support*							
List—If none, Report none	——	——	——	——	——	——	——
B. *Proposals Pending*							
1. List this proposal	——	——	——	——	——	——	——
2. Other pending proposals, including renewal applications	——	——	——	——	——	——	——
3. Proposals planned to be submitted in near future	——	——	——	——	——	——	——
II. (Name of co-principal investigator and/or faculty associate)	——	——	——	——	——	——	——
A.							
B.							
III. Transfer of Support If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.	——	——	——	——	——	——	——
IV. (Other agencies to which this proposal has been/will be submitted)	——						

APPENDIX V

CHECKLIST FOR PROPOSAL SUBMISSION

Complete proposals help to expedite review and assist the applicant to meet a planned program. To assure that research proposals submitted to the Foundation are complete, an administrative check should be made before mailing.

- ☐ Cover page (use requested format)
- ☐ Appropriate boxes under REMARKS on cover page checked
- ☐ Human Subjects Certification, if required
- ☐ Recombinant DNA Certification, if required
- ☐ All required signatures (principal investigator, co-principal investigators, and institutional)
- ☐ Table of contents
- ☐ Project summary (less than 200 words)
- ☐ Summary of progress to date and its relation to proposed work (renewals only)
- ☐ Detailed description of proposed research
- ☐ Bibliography of pertinent literature
- ☐ Vitae of all senior personnel
- ☐ Current list of main publications of senior personnel (major publications currently in press may be listed)
- ☐ Budget in requested format
- ☐ Equipment Certification, if required
- ☐ Brief description and justification of major items of requested equipment
- ☐ Brief description of type and extent of travel and its relationship to the research
- ☐ Current and pending support (see Appendix IV)
- ☐ List or description of available facilities and major items of equipment to be used in the proposed research
- ☐ Required number of copies of the proposal, including the original signed copy (see Appendix VII)

APPENDIX VI

NATIONAL SCIENCE FOUNDATION
Washington, D.C. 20550

FINAL PROJECT REPORT
NSF FORM 98A

PLEASE READ INSTRUCTIONS ON REVERSE BEFORE COMPLETING

PART I–PROJECT IDENTIFICATION INFORMATION

1. Institution and Address	2. NSF Program	3. NSF Award Number
	4. Award Period From To	5. Cumulative Award Amount
6. Project Title		

PART II–SUMMARY OF COMPLETED PROJECT *(FOR PUBLIC USE)*

PART III–TECHNICAL INFORMATION *(FOR PROGRAM MANAGEMENT USES)*

1. ITEM *(Check appropriate blocks)*	NONE	ATTACHED	PREVIOUSLY FURNISHED	TO BE FURNISHED SEPARATELY TO PROGRAM	
				Check (√)	Approx. Date
a. Abstracts of Theses					
b. Publication Citations					
c. Data on Scientific Collaborators					
d. Information on Inventions					
e. Technical Description of Project and Results	▨				
f. Other *(specify)*	▨				

2. Principal Investigator/Project Director Name *(Typed)*	3. Principal Investigator/Project Director Signature	4. Date

NSF Form 98A (5-78) Supersedes All Previous Editions

Form Approved OMB No. 99R0013

INSTRUCTIONS FOR FINAL PROJECT REPORT
(NSF FORM 98A)

This report is due within 90 days after the expiration of the award. It should be submitted in two copies to:

National Science Foundation
Division of Grants and Contracts
Post-Award Projects Branch
1800 G Street, N.W.
Washington, D.C. 20550

INSTRUCTIONS FOR PART I

These identifying data items should be the same as on the award documents.

INSTRUCTIONS FOR PART II

The summary (about 200 words) must be self-contained and intelligible to a scientifically literate reader. Without restating the project title, it should begin with a topic sentence stating the project's major thesis. The summary should include, if pertinent to the project being described, the following items:

- The primary objectives and scope of the project.
- The techniques or approaches used only to the degree necessary for comprehension.
- The findings and implications stated as concisely and informatively as possible.

This summary will be published in an annual NSF report. Authors should also be aware that the summary may be used to answer inquiries by nonscientists as to the nature and significance of the research. Scientific jargon and abbreviations should be avoided.

INSTRUCTIONS FOR PART III

Items in Part III may, but need not, be submitted with this Final Project Report. Place a check mark in the appropriate block next to each item to indicate the status of your submission.

a. Self-explanatory.
b. For publications (published and planned) include title, journal or other reference, date, and authors. Provide two copies of any reprints as they become available.
c. Scientific Collaborators: provide a list of co-investigators, research assistants and others associated with the project. Include title or status, e.g. associate professor, graduate student, etc.
d. Briefly describe any inventions which resulted from the project and the status of pending patent applications, if any.
e. Provide a technical summary of the activities and results. The information supplied in proposals for further support, updated as necessary, may be used to fulfill this requirement.
f. Include any additional material, either specifically required in the award instrument (e.g. special technical reports or products such as films, books, studies) or which you consider would be useful to the Foundation.

APPENDIX VII

Programs Providing Scientific Research Support

Required number of proposals in parentheses	*Tel No.*
Applied Research (20)	
Applied Social and Behavioral Sciences	357-7534
Applied Physical, Mathematical and Biological Sciences, and Engineering	357-7534
Astronomy (10)	
Galactic and Extragalactic Astronomy	357-7639
Solar System Astronomy	357-7620
Stars and Stellar Evolution	357-7622
Stellar Systems and Motions	357-7620
Astronomical Instrumentation and Development	357-7621
Atmospheric Sciences (10)	
Aeronomy	357-7619
Atmospheric Chemistry	357-9657
Experimental Meteorology and Weather Modification	357-9431
Meteorology	357-7624
Solar Terrestrial	357-7618
Climate Dynamics	357-9892
Global Atmospheric Research	357-9887
Behavioral and Neural Sciences (20)	
Neurobiology	357-7471
Sensory Physiology and Perception	357-7428
Social and Developmental Psychology	357-9485
Psychobiology	357-7949
Memory & Cognitive Processes	357-9898
Anthropology	357-7804
Linguistics	254-7696
Chemical and Process Engineering (10)	
Chemical and Biochemical Processes	357-9606
Engineering Energetics	357-9606
Thermodynamics and Mass Transfer	357-9606
Particulate and Multiphase Processes	357-9606
Kinetics, Catalysis and Reaction Engineering	357-9624

Area Code 202

Required number of proposals in parentheses	*Tel No.*
Chemistry (15)	
Synthetic Inorganic and Organometallic Chemistry	357-7499
Synthetic Organic and Natural Products Chemistry	357-7499
Chemical Analysis	357-7960
Chemical Instrumentation	357-7960
Structural Chemistry and Thermodynamics	357-9826
Quantum Chemistry	357-7951
Chemical Dynamics	357-7956
Civil and Mechanical Engineering (10)	
Geotechnical Engineering	357-9542
Water Resources and Env. Eng.	357-9542
Structural Mechanics	357-9545
Fluid Mechanics	357-9542
Heat Transfer	357-9542
Solid Mechanics	357-9542
Mechanical Systems	357-9542
Earth Sciences (20)	
Geochemistry	357-7498
Geology	357-7915
Geophysics	357-7916
Petrology	357-7911
Electrical Computer and Systems Engineering (10)	
Automation, Bioengineering and Sensing	357-9618
Electrical and Optical Communications	357-9618
System Theory and Operations Research	357-9618
Solid State and Microstructures	357-9618
Quantum Electronics, Waves, and Beams	357-9618
Computer Engineering	357-7569

Area Code 202

Environmental Biology (20)

Ecosystem Studies	357-9596
Ecology	357-9734
Systematic Biology	357-9588
Biological Research Resources	357-7475
Population Biology and Physiological Ecology	357-9728

Information Science and Technology (15)	357-9572

Intergovernmental Science and Public Technology

Intergovernmental Program (20)	357-7560
Industrial Program (10)	357-7527
Appropriate Technology Program (15)	357-7491

International Programs (10)	357-9552

Materials Research (10)

Ceramics	357-9789
Metallurgy	357-9789
Polymers	357-9789
Condensed Matter Theory	357-9737
Low-Temperature Physics	357-9787
Solid State Chemistry	357-9787
Solid State Physics	357-9737
Materials Research Laboratories (15)	357-9791

Mathematical and Computer Sciences (10)

Algebra and Number Theory	357-9764
Applied Mathematics	357-9764
Statistics and Probability	357-9764
Classical Analysis	357-9764
Modern Analysis	357-9764
Special Projects (Math)	357-9764
Topology, Foundations and Geometry	357-9764
Theoretical Computer Science	357-9509
Software Systems Science	357-9746
Computer Systems Design	357-9746
Intelligent Systems	357-9507
Software Engineering	357-9746
Special Projects (Computer)	357-9511

Oceanography (20)

Biological Oceanography	357-9600
Marine Chemistry	357-7910
Physical Oceanography	357-7932
Submarine Geology and Geophysics	357-7912

Area Code 202

Physics (15*)

Atomic, Molecular, and Plasma Physics	357-7997
Elementary Particle Physics	357-9575
Gravitational Physics	357-7979
Intermediate Energy Physics	357-7993
Nuclear Physics	357-7992
Theoretical Physics	357-7979

Physiology, Cellular & Molecular Biology (20)

Developmental Biology	357-7989
Genetic Biology	357-9687
Cell Biology	357-7474
Human Cell Biology	357-7647
Biochemistry	357-7945
Biophysics	357-7945
Regulatory Biology	357-7975
Metabolic Biology	357-7987

Planning and Resources Management (10)

Research Instrumentation: 2 and 4 Year Colleges	357-9615

Polar Sciences (15)

Advanced Systems Applications and Glaciology	357-7894
Polar Atmospheric Sciences	357-7894
Polar Biology and Medicine	357-7894
Polar Earth Science	357-7894
Polar Meteorology	357-7894
Polar Ocean Sciences	357-7894

Problem-Focused Research (15)

Alternative Biological Sources of Materials	357-9782
Earthquake Hazards Mitigation	357-7311
Human Nutrition	357-9502
Science and Technology to Aid the Handicapped	357-7734
Problem Analysis	357-7319

Social and Economic Sciences (20)

Economics	357-9674
Geography and Regional Science	357-7326
Law and Social Sciences	357-9567
Political Science	357-9406
Sociology	357-7802
Measurement Methods and Data Resources	357-7913
History and Philosophy of Science	357-7617

Area Code 202

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*20 for group research, large facilities construction, modification, or operation.

ADDENDUM: UNSOLICITED PROPOSALS TO CERTAIN ENGINEERING AND APPLIED SCIENCE (EAS) DIVISIONS

Introduction: This addendum, which provides guidance for the preparation and submission of unsolicited proposals, expands the use of the Grants for Scientific Research (GSR) to include unsolicited proposals to three EAS Divisions: Problem-Focused Research, Applied Research, and Intergovernmental Science and Public Technology.

Previously these Divisions were covered by NSF 78-46, *ASRA Guidelines for the Preparation of Unsolicited Proposals*, which is now canceled. (For a description of the programs supported by these Divisions, see *NSF 79-36, Guide to Programs.*)

Proposals submitted to these Divisions should be prepared in accordance with the provisions of the GSR and this Addendum. For the other EAS Divisions, i.e., Chemical and Process Engineering, Electrical, Computer and Systems Engineering, and Civil and Mechanical Engineering, the GSR should be used *without* this Addendum.

Guidelines: The following paragraphs modify or supplement the provisions of the GSR:

(1) *Types of Research Supported:* Support will not normally be provided for specialized research equipment except when its is a necessary part of a research grant.

(2) *Who May Submit:* Proposals may be submitted by colleges, universities, industry, including small business, and other organizations whether operating for profit or on a not-for-profit basis, as well as by state, regional, and local units of government, and individuals without organizational sponsorship.

(3) *Project Summary:* In addition to the requirements of GSR, the summary of an applied research proposal should include a description of the applicability of the proposed research.

(4) *Project Description:* In addition to following the provisions of *GSR*, the proposer should carefully assess the potential application and utility of the proposed research.

If the proposer believes that the research will have some short-term payoff upon completion, a section entitled "Utilization Strategy" should be included. Where appropriate, this section should discuss the importance of the application of the proposed work; how potential users are to be involved in the design, conduct, evaluation, or dissemination of the research; strategies for disseminating technology or information to potential users; etc. The budget for the proposal should reflect such activities.

If the proposer believes the research has a longer term payoff or that a number of studies and developments, of which this study is only one, will be required before the work may be applied directly to a problem area, then a section entitled "Application Potential and Future Requirements" should be included in the proposal. This section should discuss the problem toward which the research is oriented and its long-run social, economic, or technological significance; and give a clear idea of the additional research and applications that might be required eventually to realize the full potential of the research.

(5) *Final Reports:* In addition to the required final expenditure information and a Final Project Report (NSF Form 98A, Part I and II), a minimum of 10 copies of a detailed final technical report (addressed in NSF Form 98A, Part III) is required. While no standard format is prescribed for the technical

reports, the activities and results of the project should be described in sufficient detail to permit NSF and others to assess the value and significance of the research. A statement describing the actual or potential utilization of the research results should be included. General guidelines for preparing a technical report may be obtained by writing to: Programs and Resources Officer/EAS, National Science Foundation, Washington, D.C. 20550.

(6) *Intergovernmental Program:* Before submitting a proposal to the Intergovernmental Program, interested persons should contact the program staff (202-357-7560) for guidance on compliance with the submission requirements of the Intergovernmental Cooperation Act of 1974 (42USC8425/*et seq.*) and OMB Circular A-95 (Project Notification and Review System).

END

06-21-82